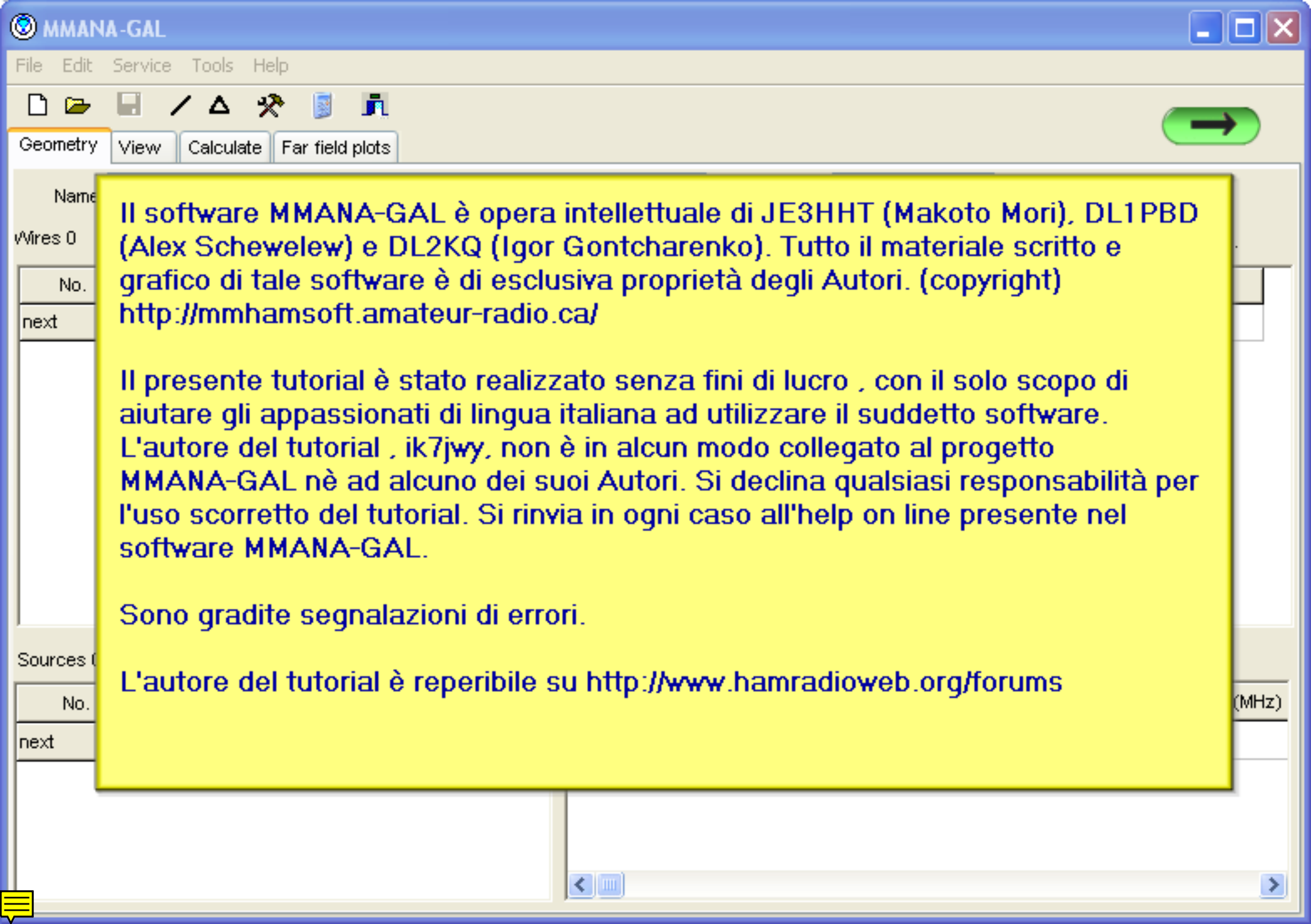
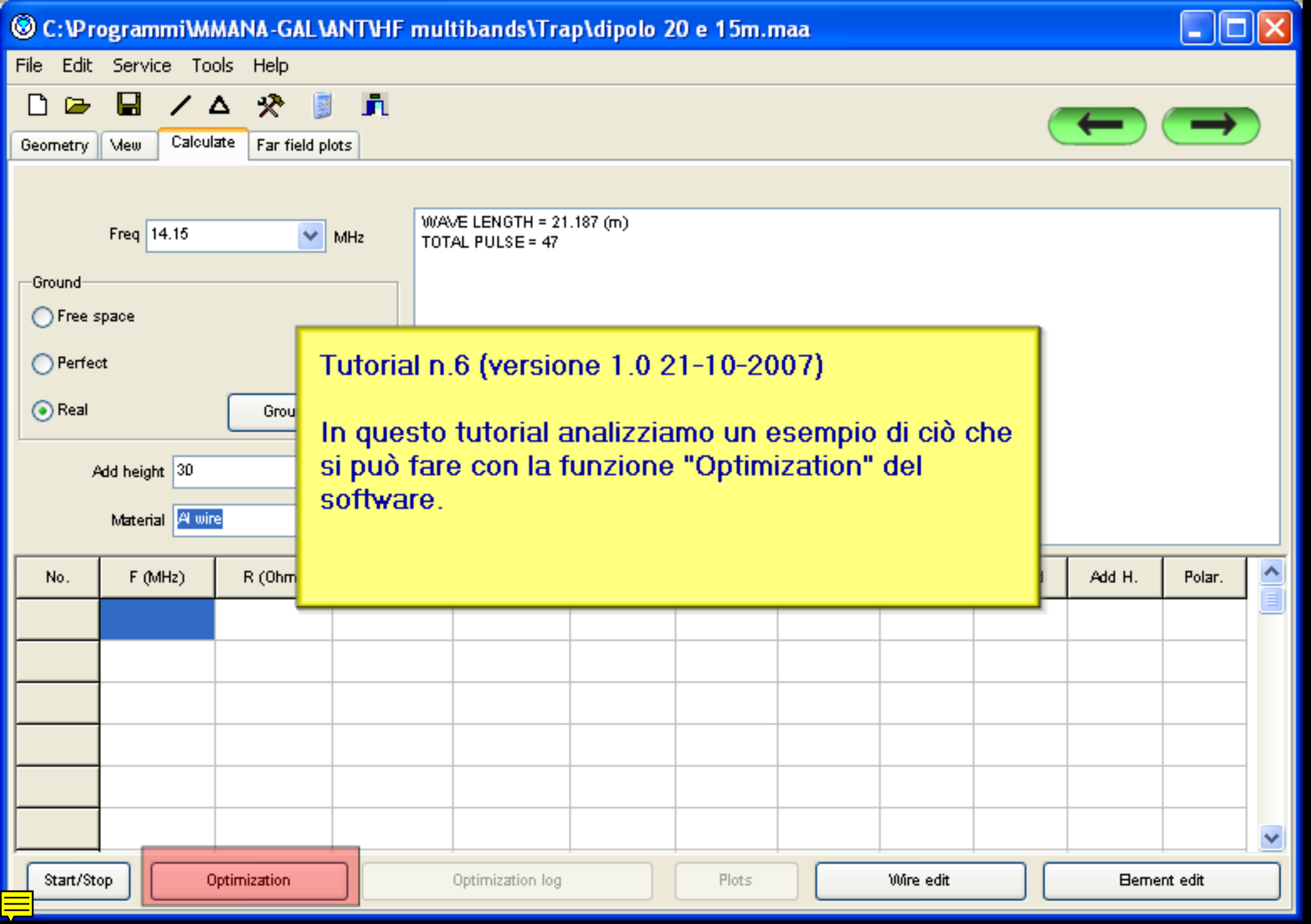

MMANA-GAL
File Edit Service Tools Help
Geometry View Calculate Far field plots
Name
Wires 0
No.
next
Sources
No.
next
(MHz)
Il software MMANA-GAL è opera intellettuale di JE3HHT (Makoto Mori), DL1PBD (Alex Schewelew) e DL2KQ (Igor Gontcharenko). Tutto il materiale scritto e grafico di tale software è di esclusiva proprietà degli Autori. (copyright) http://mmhamsoft.amateur-radio.ca/
Il presente tutorial è stato realizzato senza fini di lucro , con il solo scopo di aiutare gli appassionati di lingua italiana ad utilizzare il suddetto software. L'autore del tutorial , ik7jwy, non è in alcun modo collegato al progetto MMANA-GAL nè ad alcuno dei suoi Autori. Si declina qualsiasi responsabilità per l'uso scorretto del tutorial. Si rinvia in ogni caso all'help on line presente nel software MMANA-GAL.
Sono gradite segnalazioni di errori.
L'autore del tutorial è reperibile su http://www.hamradioweb.org/forums


C:\Programmi\MMANA-GAL\ANT\HF multibands\Trap\dipolo 20 e 15m.maa
File Edit Service Tools Help
Geometry View Calculate Far field plots
Freq 14.15 MHz
WAVE LENGTH = 21.187 (m)
TOTAL PULSE = 47
Ground
Free space
Perfect
Real
Add height 30
Material Al wire
Tutorial n.6 (versione 1.0 21-10-2007)
In questo tutorial analizziamo un esempio di ciò che si può fare con la funzione "Optimization" del software.
No. F (MHz) Add H. Polar.
Start/Stop Optimization Optimization log Plots Wire edit Element edit

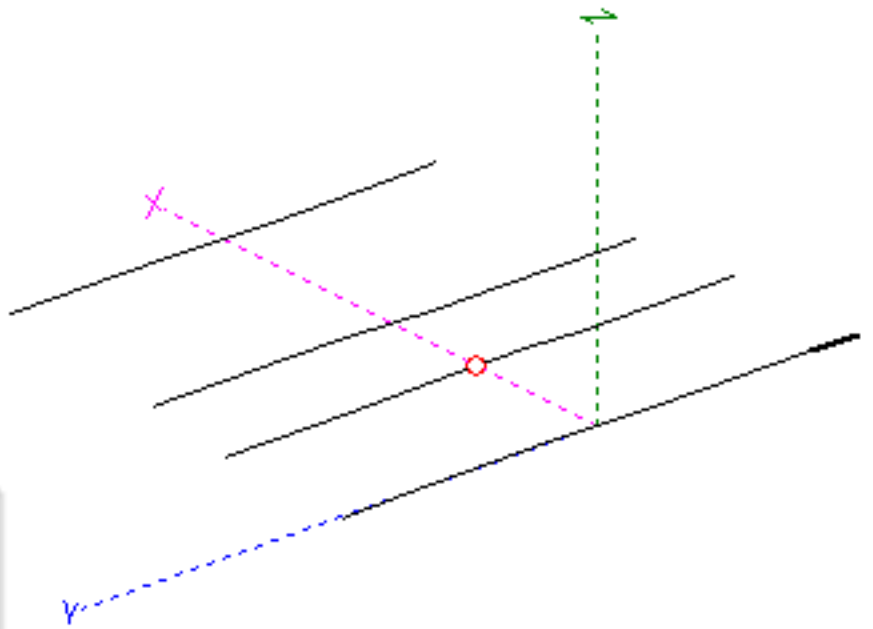
C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

Rotate around : Selected wire | Middle point of antenna | X=0, Y=0, Z=H | Save image

Source
Load



In particolare, vediamo come si può studiare la variazione dei diagrammi di radiazione di una Yagi-Uda 4 elementi per la banda dei 20 metri al variare dell'altezza di installazione.

Wire No.1
X1 : 0.0 m
Y1 : -5.421 m
Z1 : 0.0 m
X2 : 0.0 m
Y2 : -4.43 m
Z2 : 0.0 m
R : 12.0 mm
Length : 0.991 m
Aeim. : 0.0 deg
Zenith : 90.0 deg

Zoom | Currents | Zoom currents | Selected wire 1 | Pen width x 2

Segments

C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

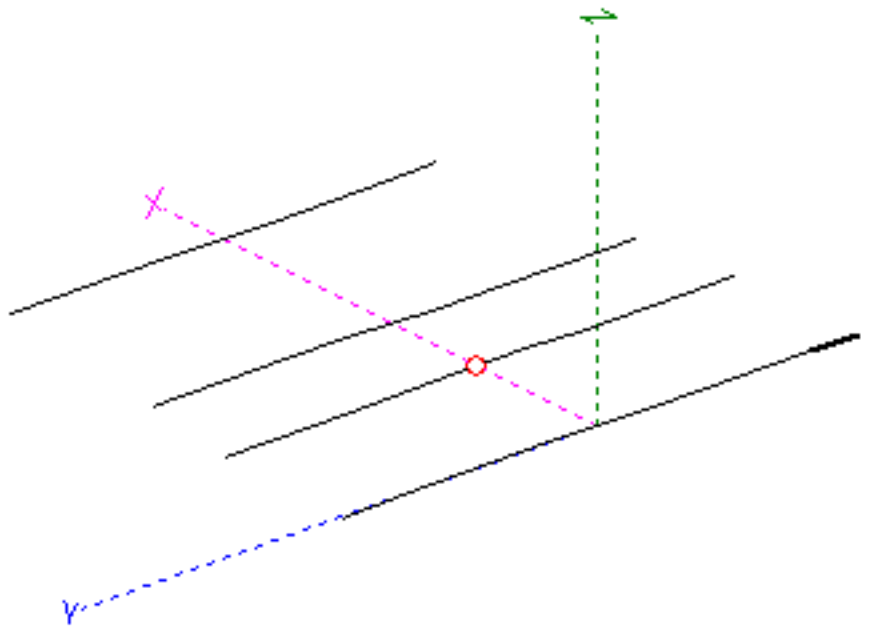
File Edit Service Tools Help

Geometry View Calculate

dopo aver caricato il file con la geometria dell'antenna, lanciamo il calcolo

Rotate around : Sele ddle point of antenna X=0, Y=0, Z=H Save image

Source
Load



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Z1 : 0.0 m
X2 : 0.0 m
Y2 : -4.43 m
Z2 : 0.0 m
R : 12.0 mm
Length : 0.991 m
Azim. : 0.0 deg
Zenith : 90.0 deg

Zoom
Currents
Segments
Zoom currents
Selected wire 1
Pen width x 2

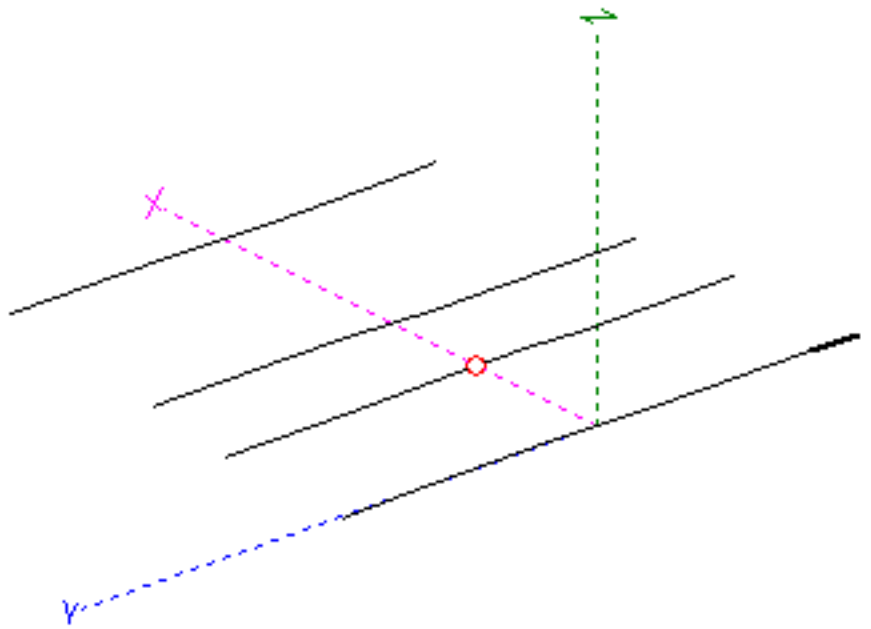
C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

Rotate around : ○ Selected wire ◉ Middle point of antenna ○ X=0, Y=0, Z=H Save image

○ Source
✕ Load



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R : 12.0 mm
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Azim. : 0.0 deg
Zenith : 90.0 deg

Zoom

☑ Currents
☐ Segments

Zoom currents

Selected wire 1

☐ Pen width x 2

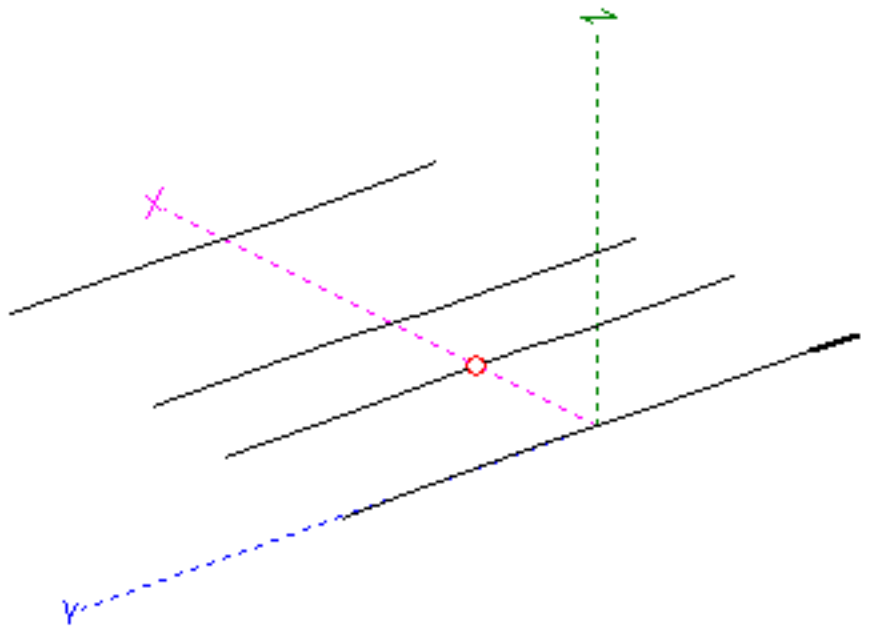
C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

Rotate around : Selected wire | Middle point of antenna | X=0, Y=0, Z=H | Save image

Source
Load



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Z2 : 0.0 m
R : 12.0 mm
Length : 0.991 m
Azim. : 0.0 deg
Zenith : 90.0 deg

Zoom

Currents

Segments

Zoom currents

Selected wire 1

Pen width x 2

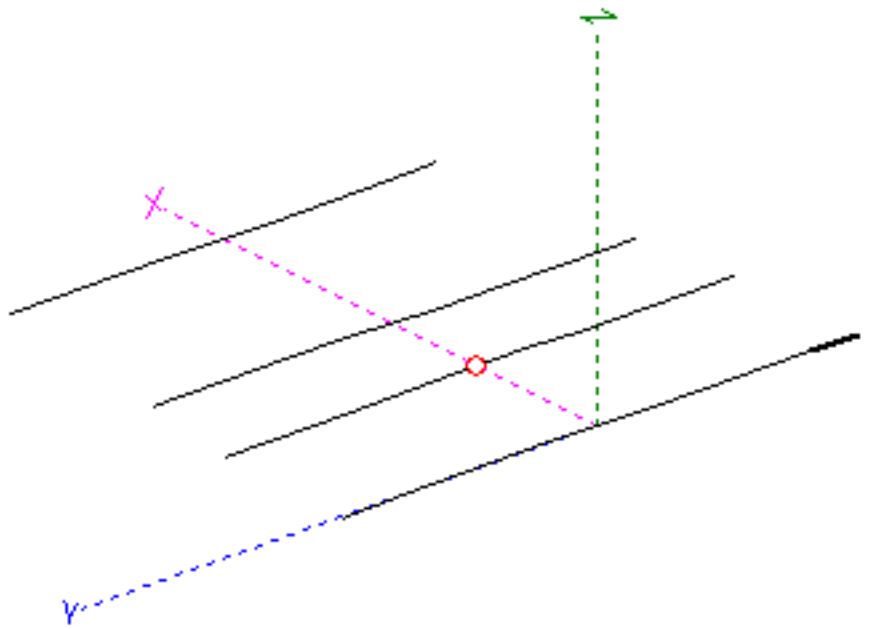
C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

Rotate around : Selected wire | Middle point of antenna | X=0, Y=0, Z=H | Save image

Source
Load



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Y2 : -4.43 m
Z2 : 0.0 m
R : 12.0 mm
Length : 0.991 m
Azim. : 0.0 deg
Zenith : 90.0 deg

Zoom

Currents

Segments

Zoom currents

Selected wire 1

Pen width x 2

C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

Rotate around : Selected wire | Middle point of antenna | X=0, Y=0, Z=H | Save image

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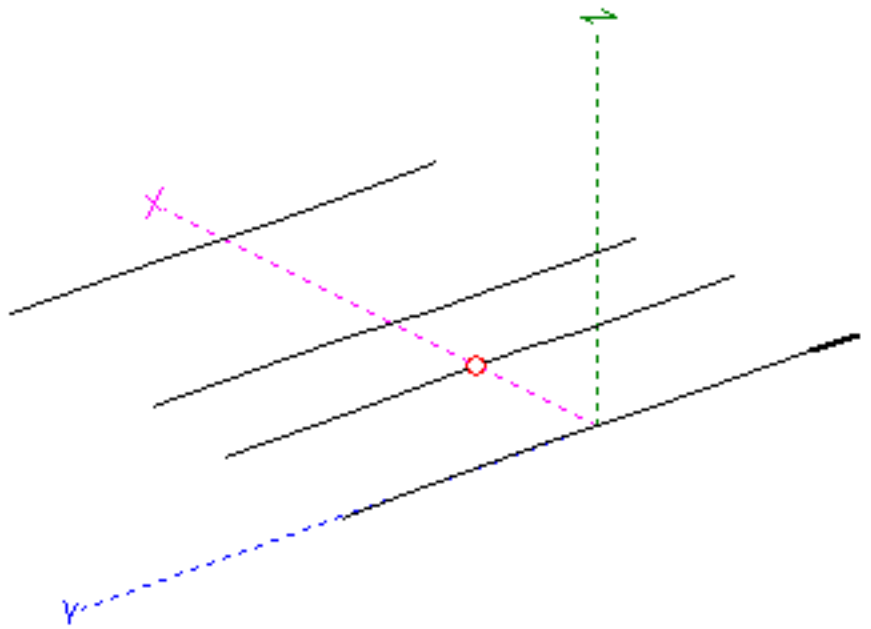
Load



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Azim. : 0.0 deg
Zenith : 90.0 deg

Zoom

Currents

Segments

Zoom currents

Selected wire 1

Pen width x 2

C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

Rotate around : Selected wire | Middle point of antenna | X=0, Y=0, Z=H | Save image

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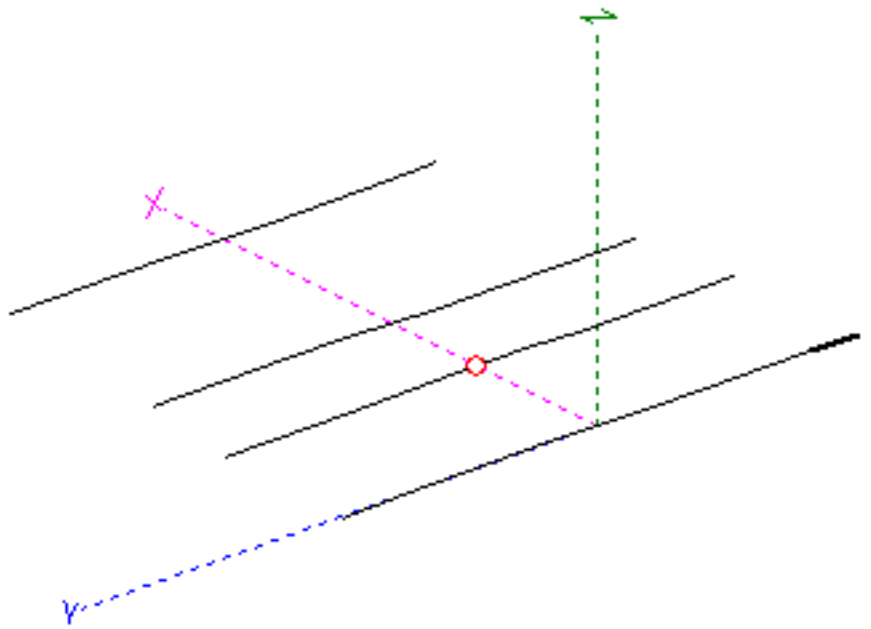
Load



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R : 12.0 mm
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Azim. : 0.0 deg
Zenith : 90.0 deg

Zoom

Currents

Segments

Zoom currents

Selected wire 1

Pen width x 2

C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

Rotate around : Selected wire | Middle point of antenna | X=0, Y=0, Z=H | Save image

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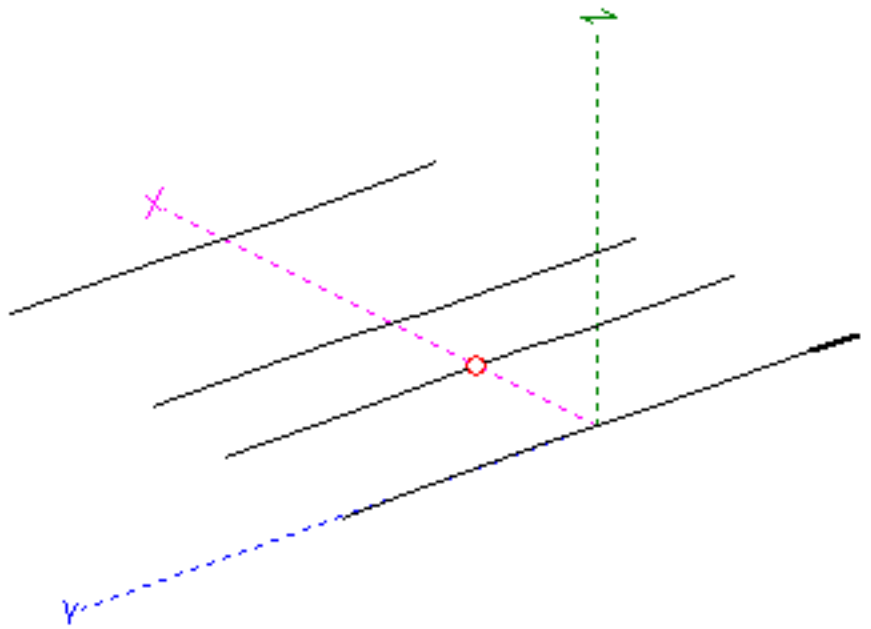
Load



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Zenith : 90.0 deg

Zoom

Currents

Segments

Zoom currents

Selected wire 1

Pen width x 2

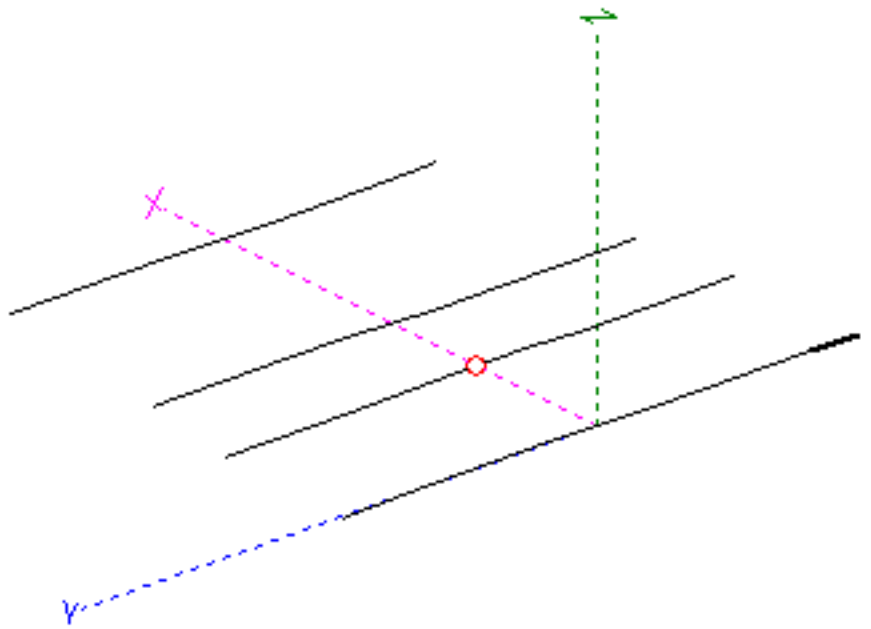
C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

Rotate around : Selected wire | Middle point of antenna | X=0, Y=0, Z=H | Save image

Source
Load



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Zoom

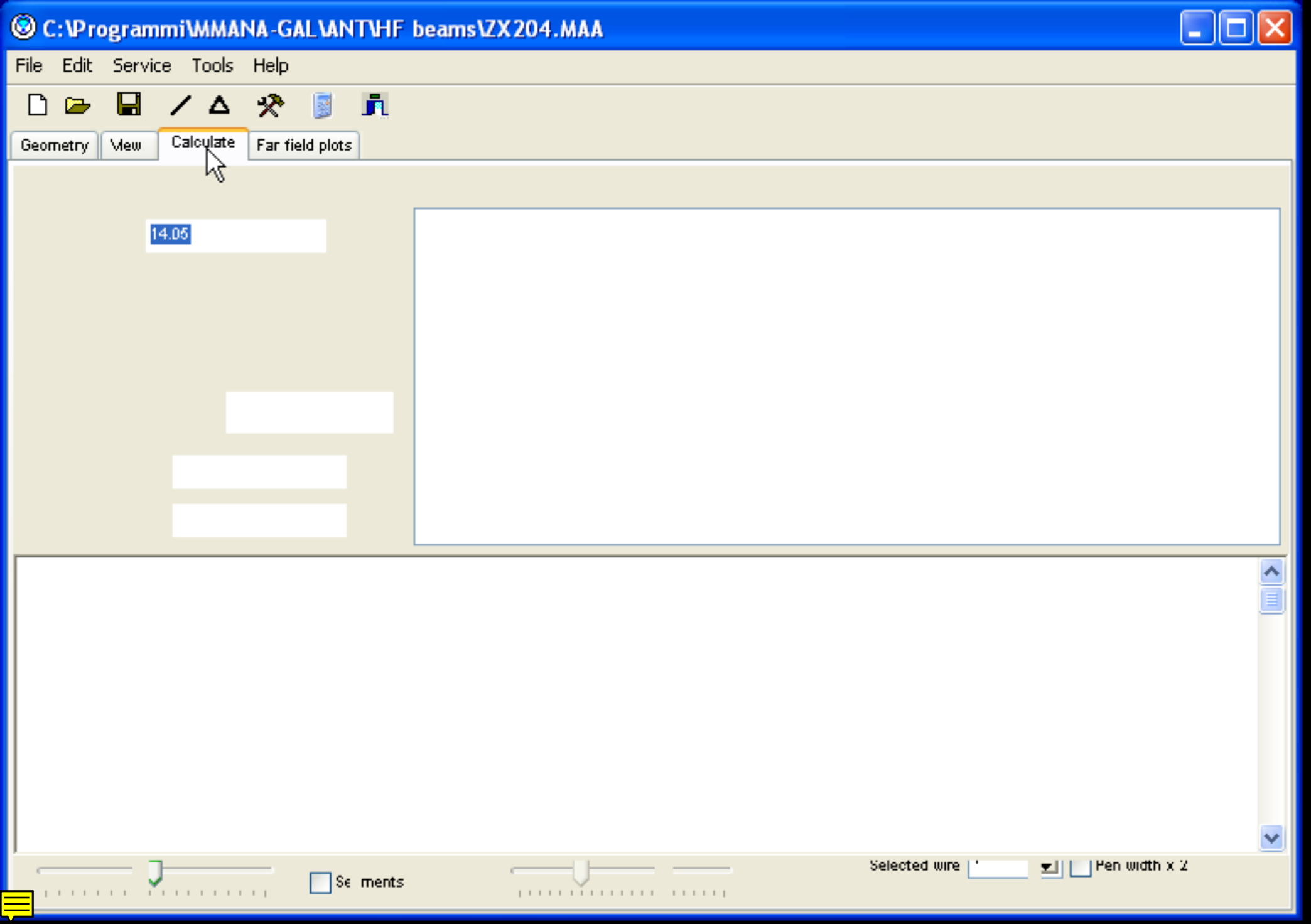
Currents

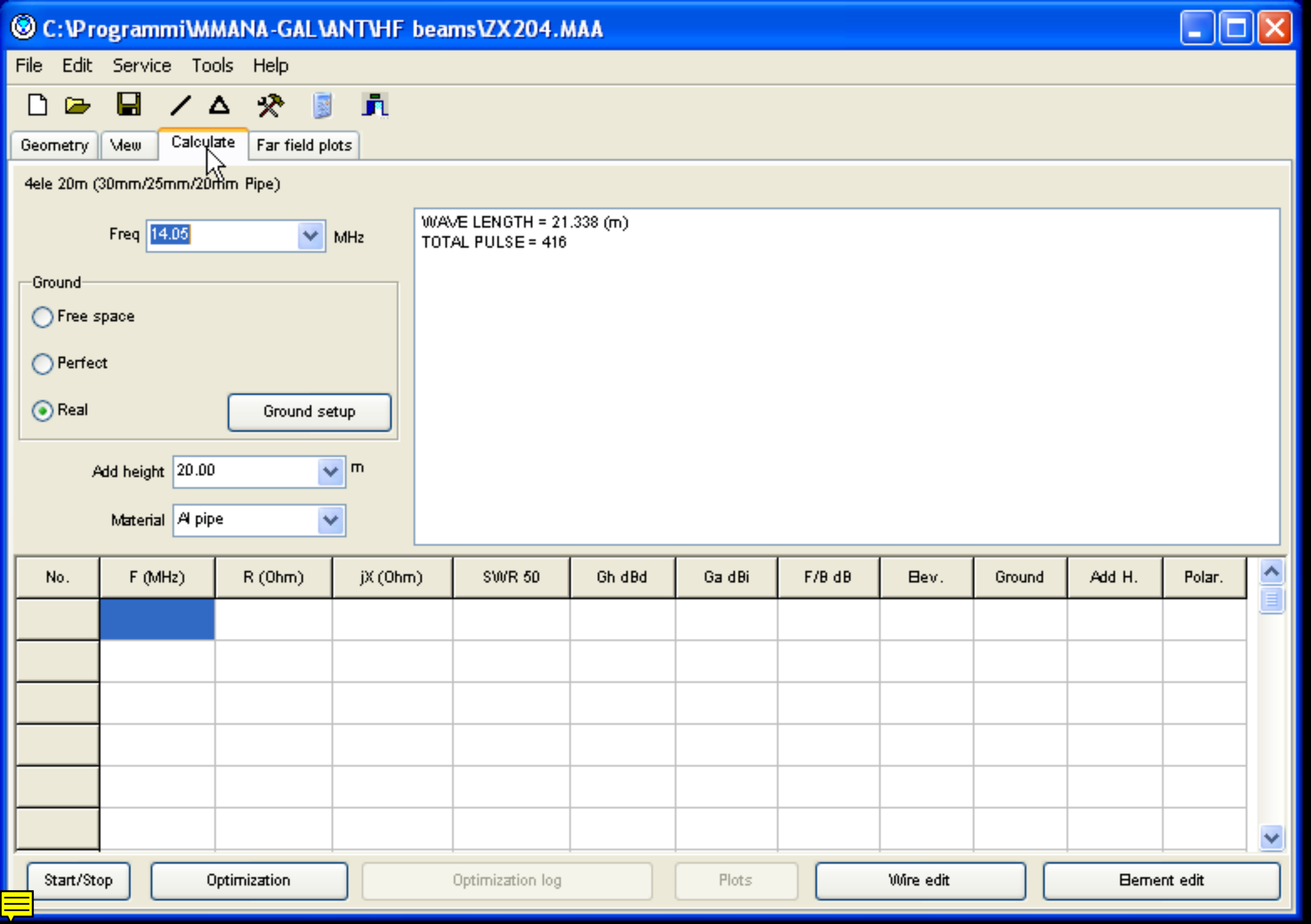
Segments

Zoom currents

Selected wire 1

Pen width x 2


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File
Edit
Service
Tools
Help
Geometry
View
Calculate
Far field plots
14.05
Selected wire
Pen width x 2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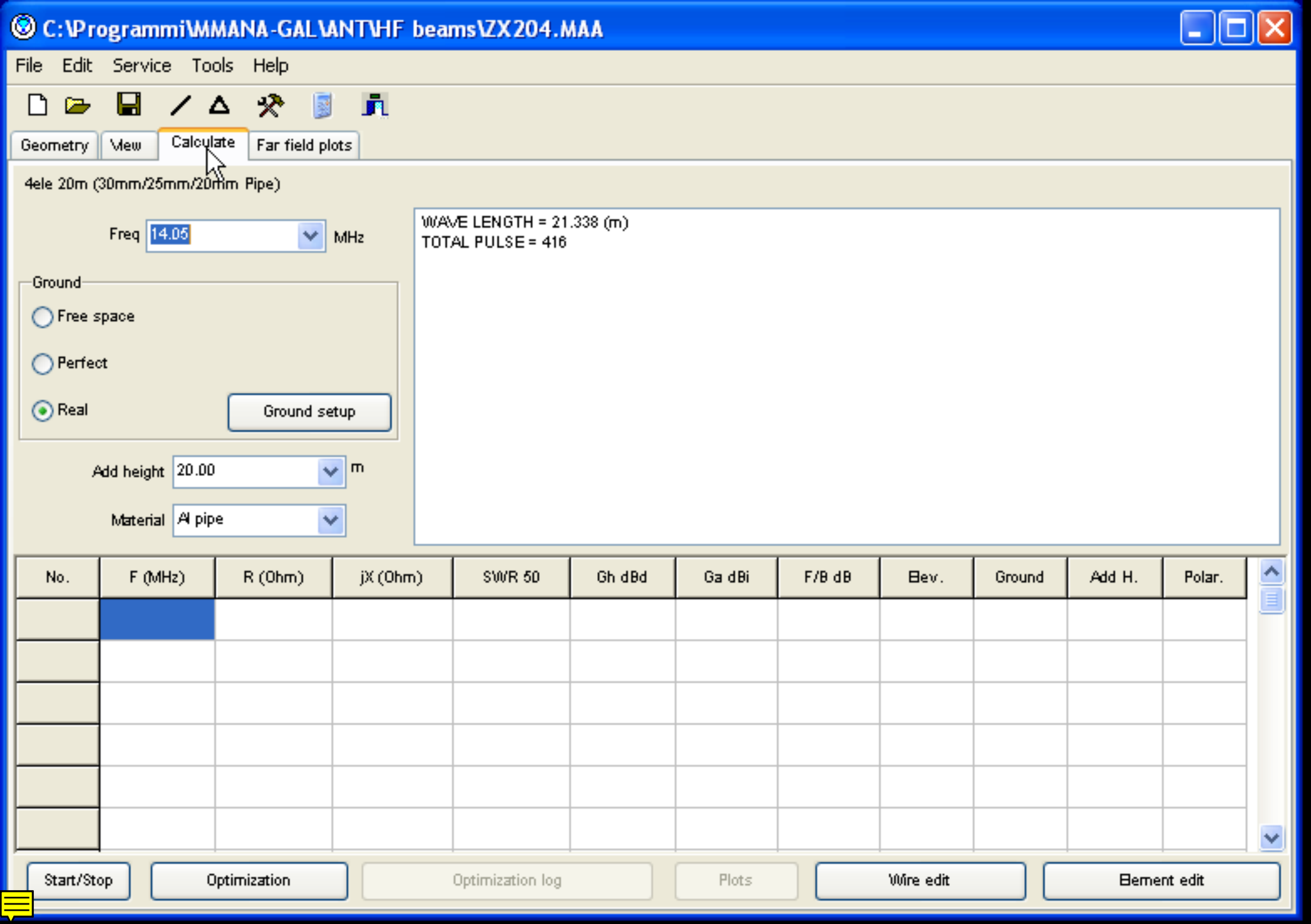
File
Edit
Service
Tools
Help
Geometry
View
Calculate
Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
Freq
14.05
MHz
Ground
Free space
Perfect
Real
Ground setup
Add height
20.00
m
Material
Al pipe
WAVE LENGTH = 21.338 (m)
TOTAL PULSE = 416
No.
F (MHz)
R (Ohm)
jX (Ohm)
SWR 50
Gh dBd
Ga dBi
F/B dB
Elev.
Ground
Add H.
Polar.
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
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Tools
Help
Geometry
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Far field plots
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Polar.
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Optimization
Optimization log
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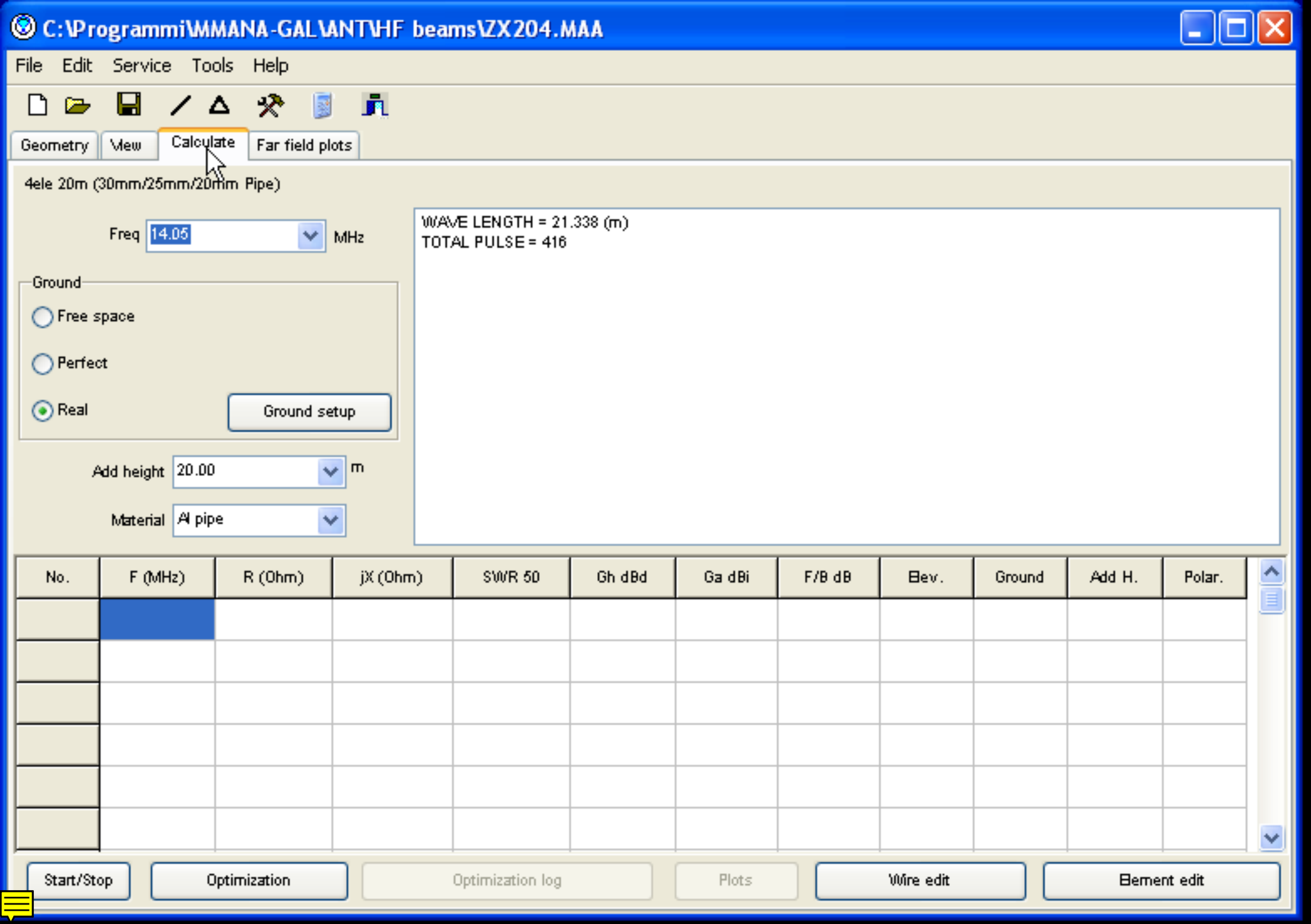
Wire edit
Element edit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File
Edit
Service
Tools
Help
Geometry
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Calculate
Far field plots
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Ground
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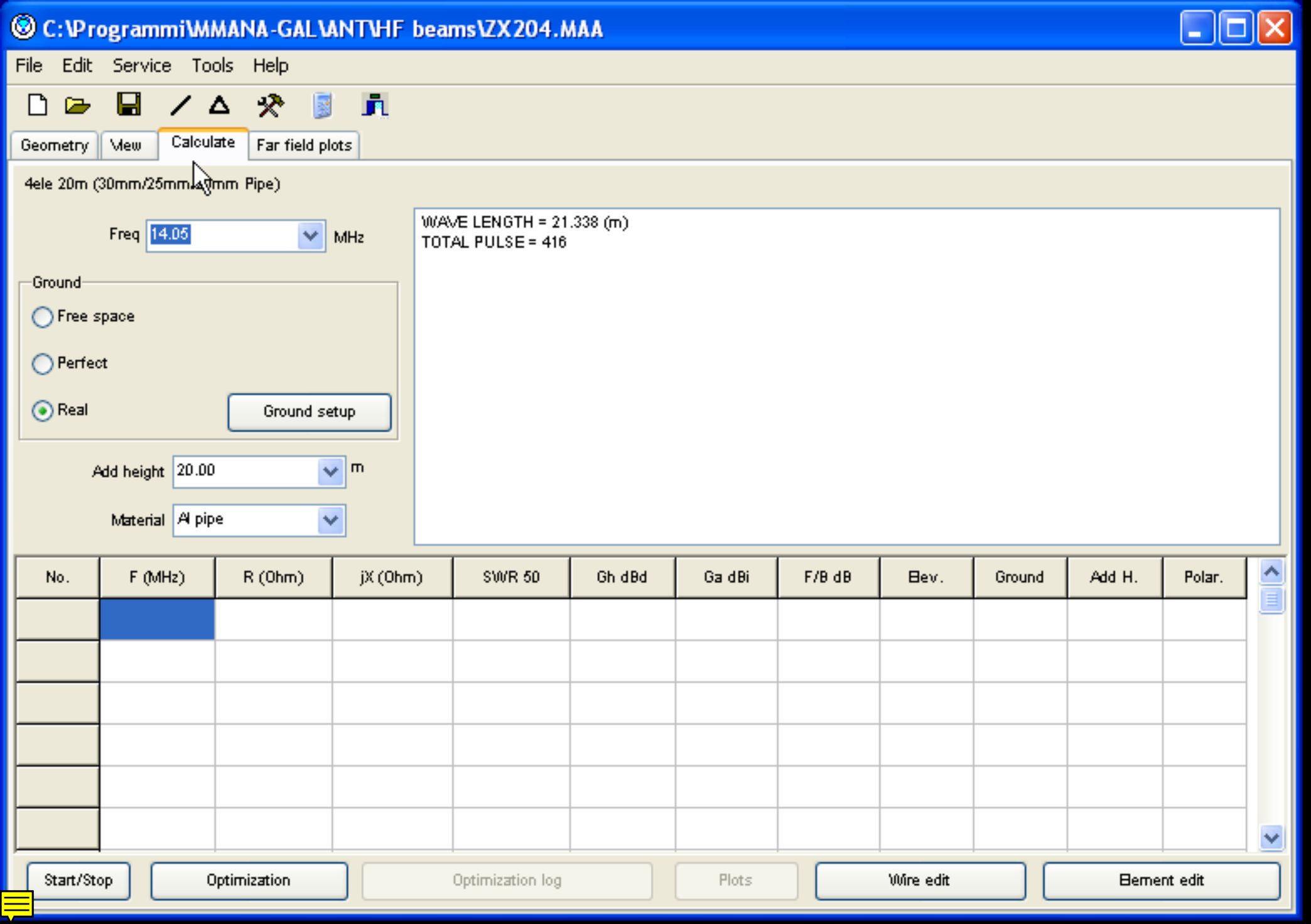
Polar.
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File Edit Service Tools Help
Geometry View Calculate Far field plots
4ele 20m (30mm/25mm/19mm Pipe)
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Add height 20.00 m
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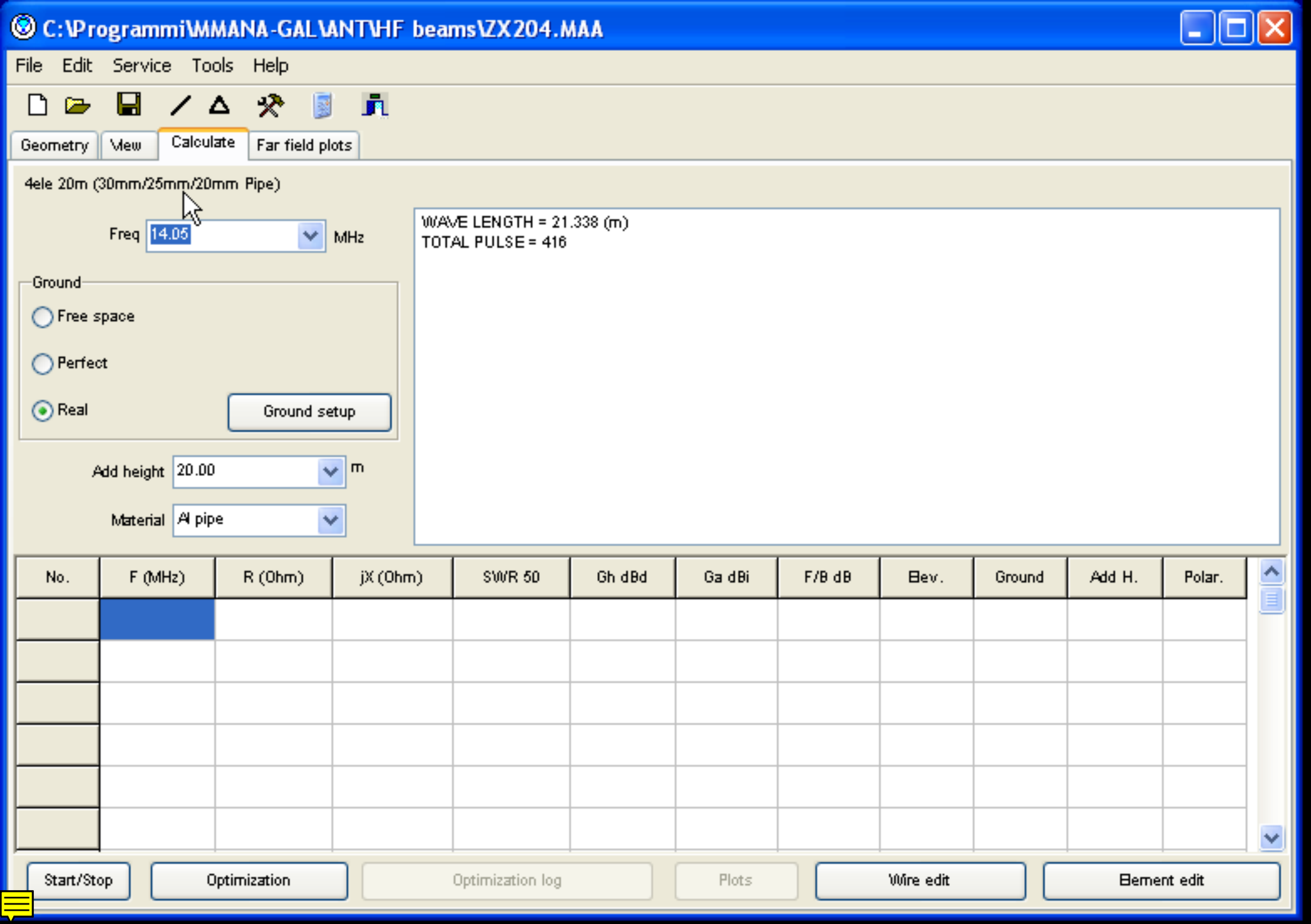
No. F (MHz) R (Ohm) jX (Ohm) SWR 50 Gh dBd Ga dBi F/B dB Elev. Ground Add H. Polar.
Start/Stop Optimization Optimization log Plots Wire edit Element edit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Geometry View Calculate Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
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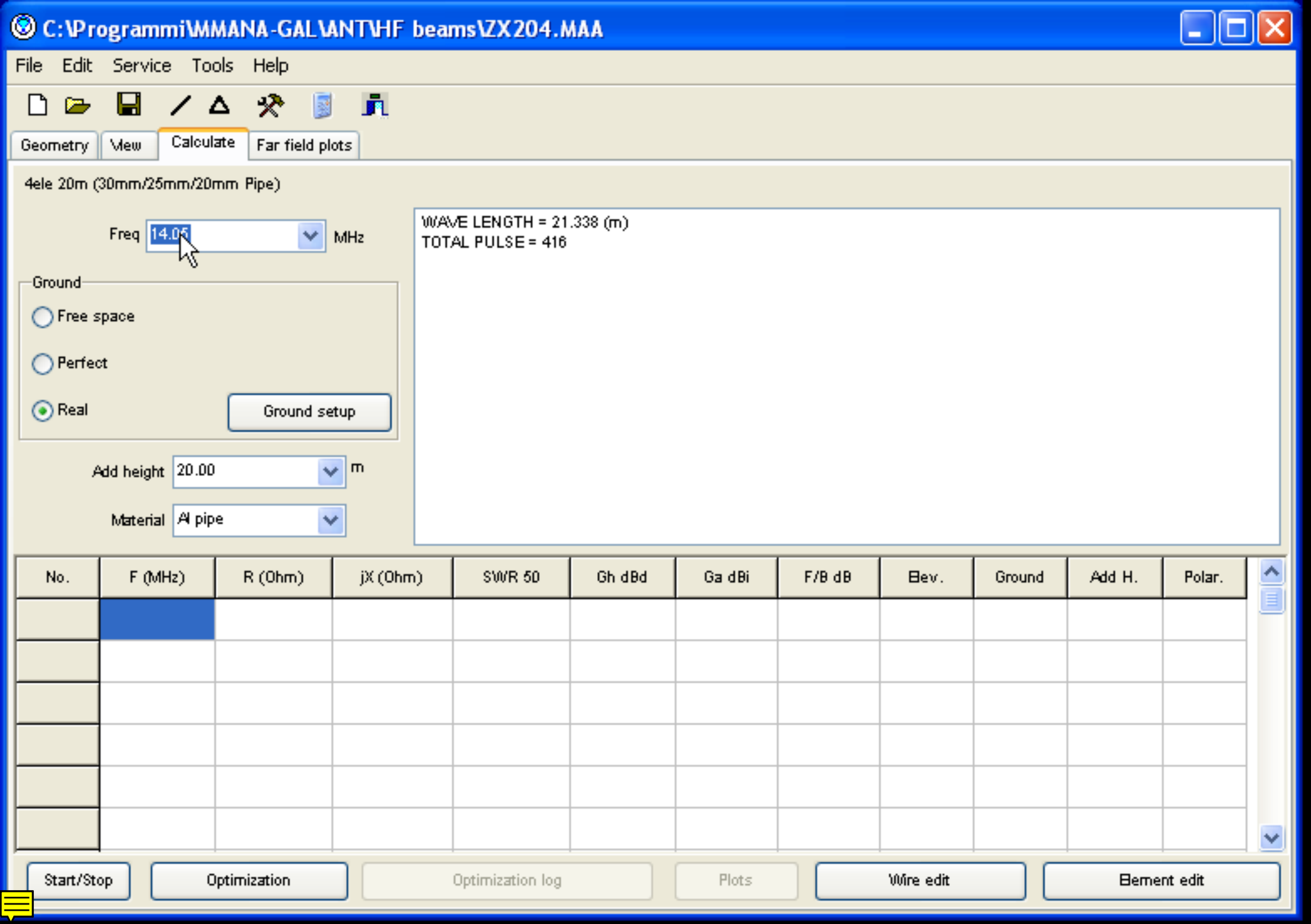
C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File Edit Service Tools Help
Geometry View Calculate Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
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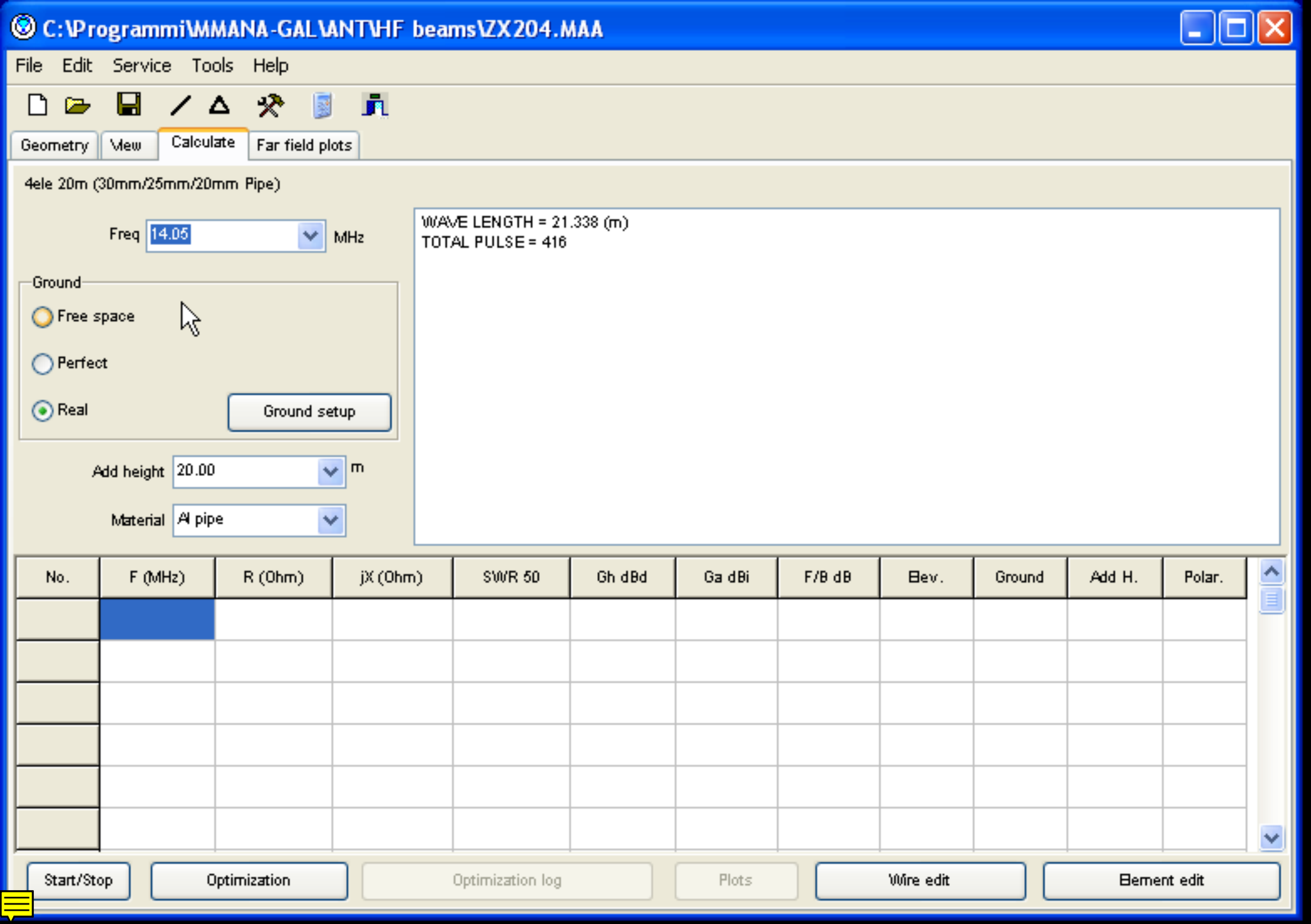
C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File Edit Service Tools Help
Geometry View Calculate Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
Freq 14.05 MHz
Ground
Free space
Perfect
Real
Ground setup
Add height 20.00 m
Material Al pipe
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TOTAL PULSE = 416
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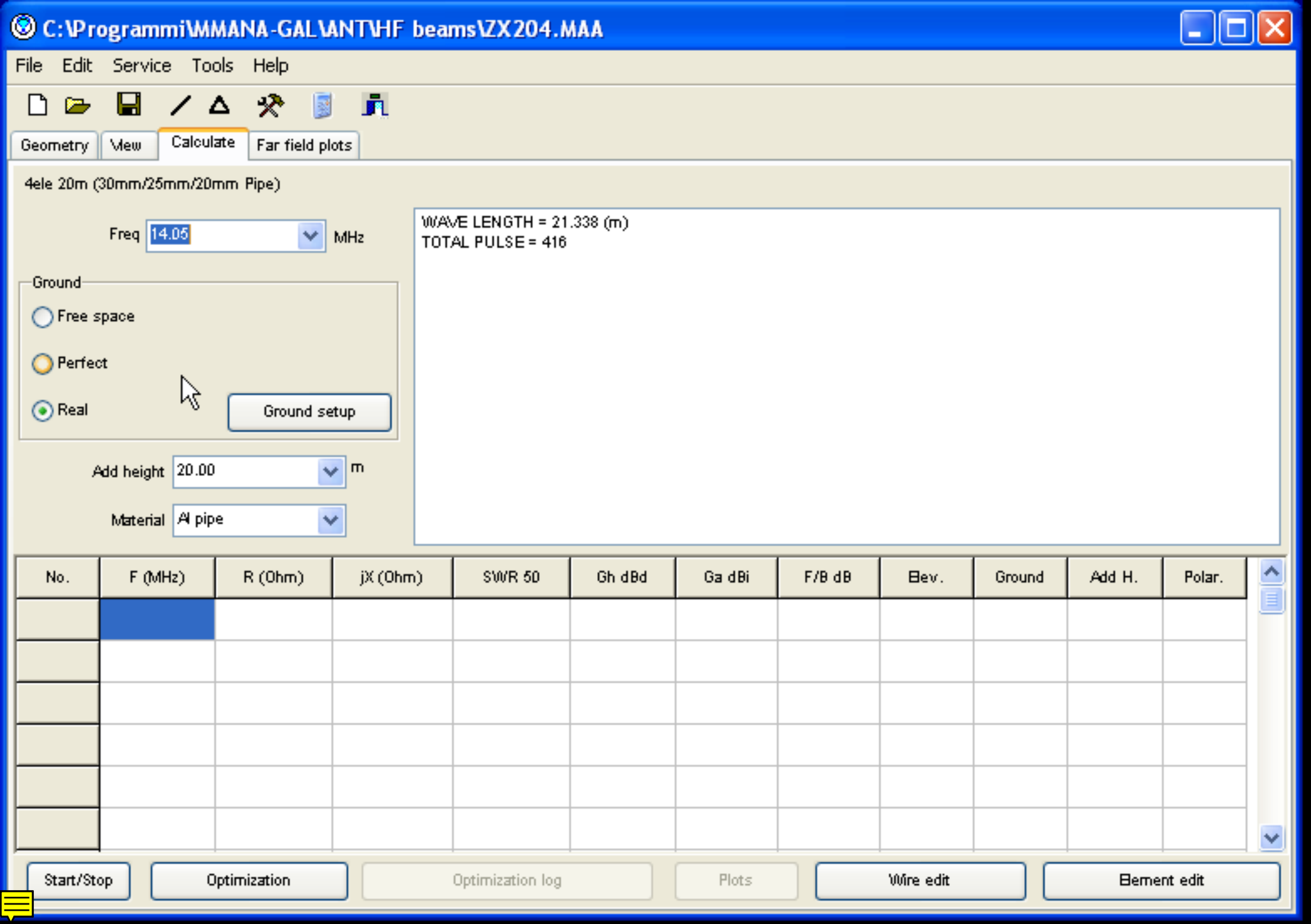
Start/Stop Optimization Optimization log Plots Wire edit Element edit


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File Edit Service Tools Help
Geometry View Calculate Far field plots
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Freq 14.05 MHz
Ground
Free space
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Add height 20.00 m
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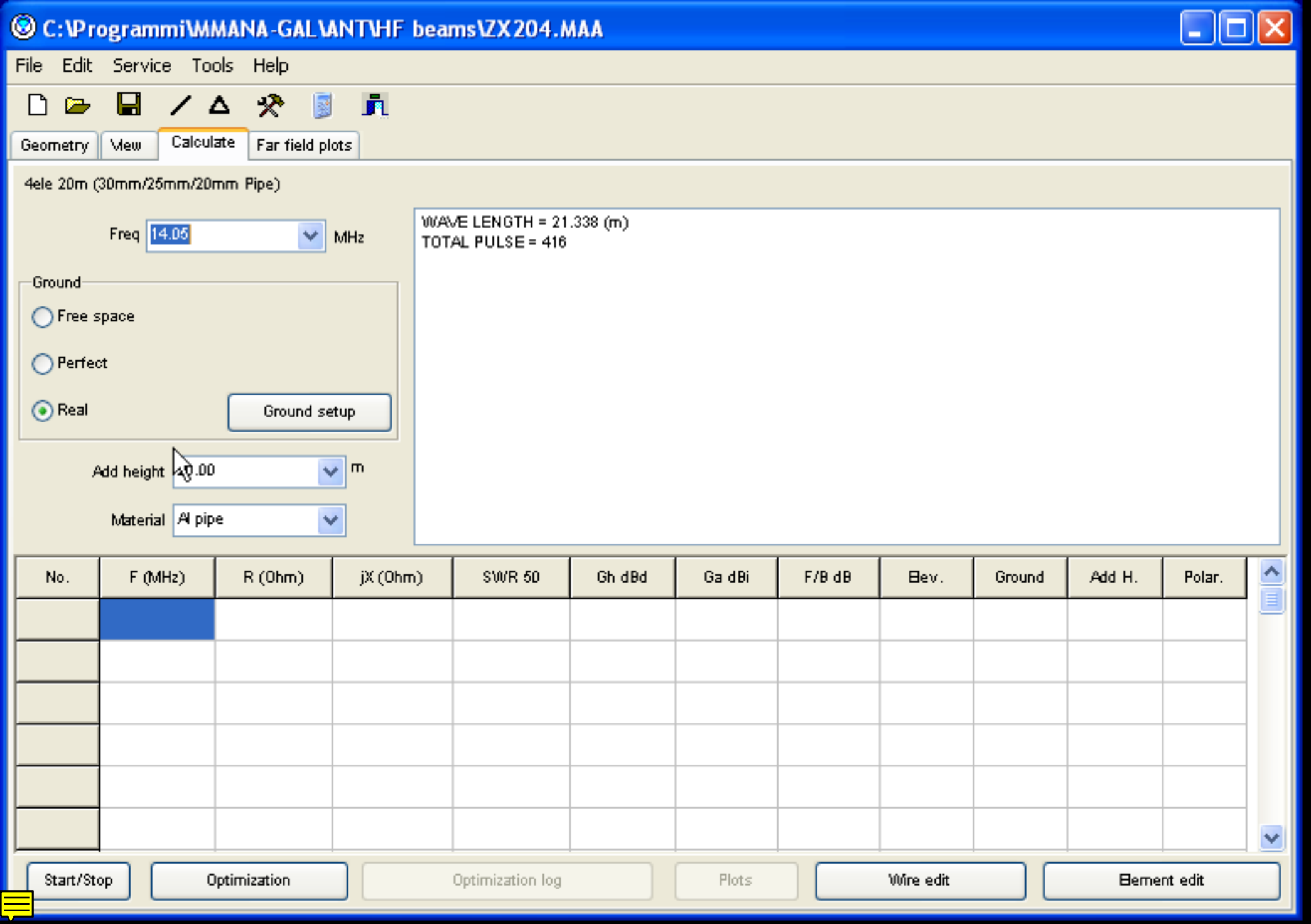
Start/Stop Optimization Optimization log Plots Wire edit Element edit


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File Edit Service Tools Help
Geometry View Calculate Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
Freq 14.05 MHz
Ground
Free space
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Real
Ground setup
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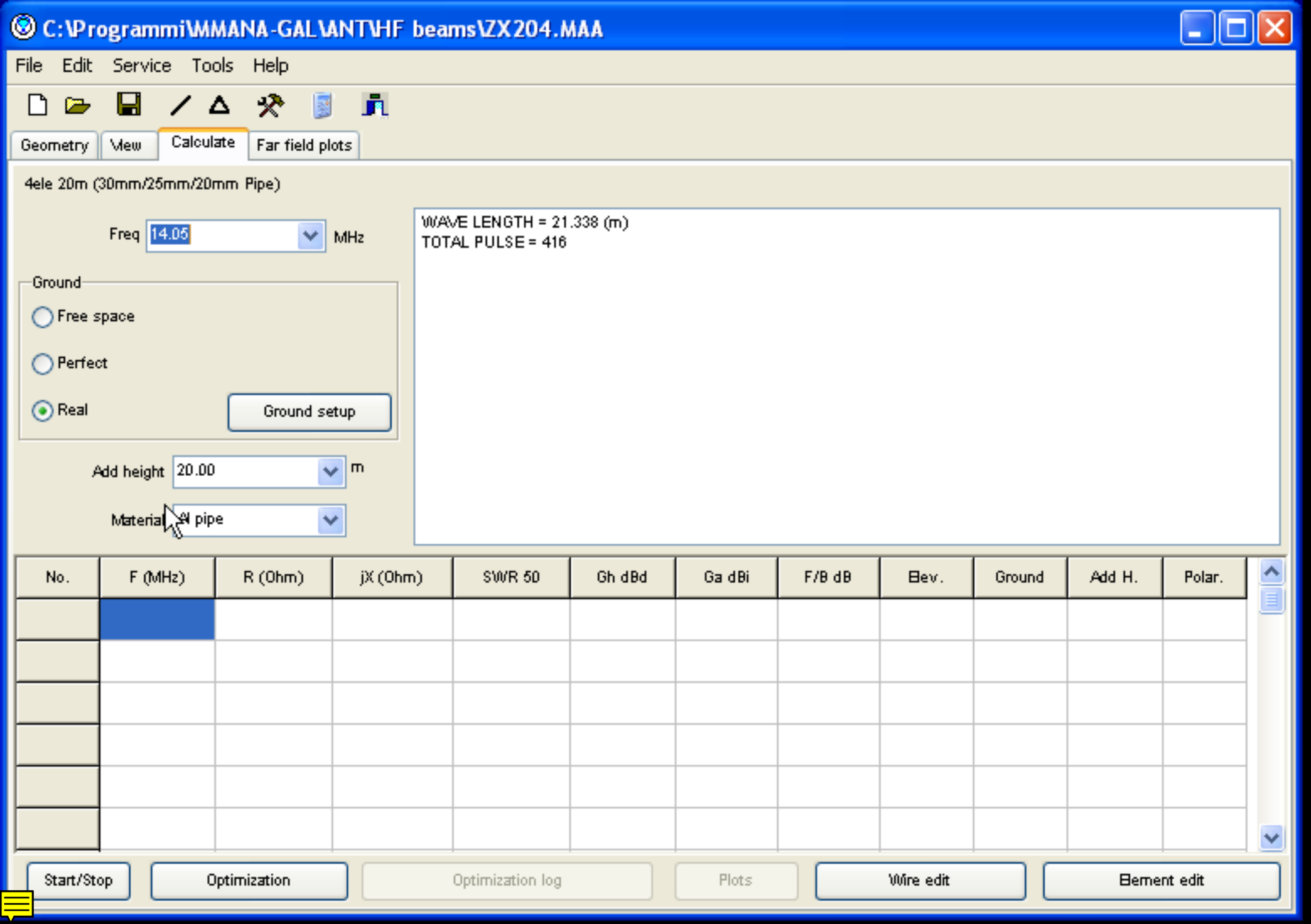
Material Al pipe
WAVE LENGTH = 21.338 (m)
TOTAL PULSE = 416
No. F (MHz) R (Ohm) jX (Ohm) SWR 50 Gh dBd Ga dBi F/B dB Elev. Ground Add H. Polar.
Start/Stop Optimization Optimization log Plots Wire edit Element edit


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
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Geometry View Calculate Far field plots
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Freq 14.05 MHz
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Ground setup
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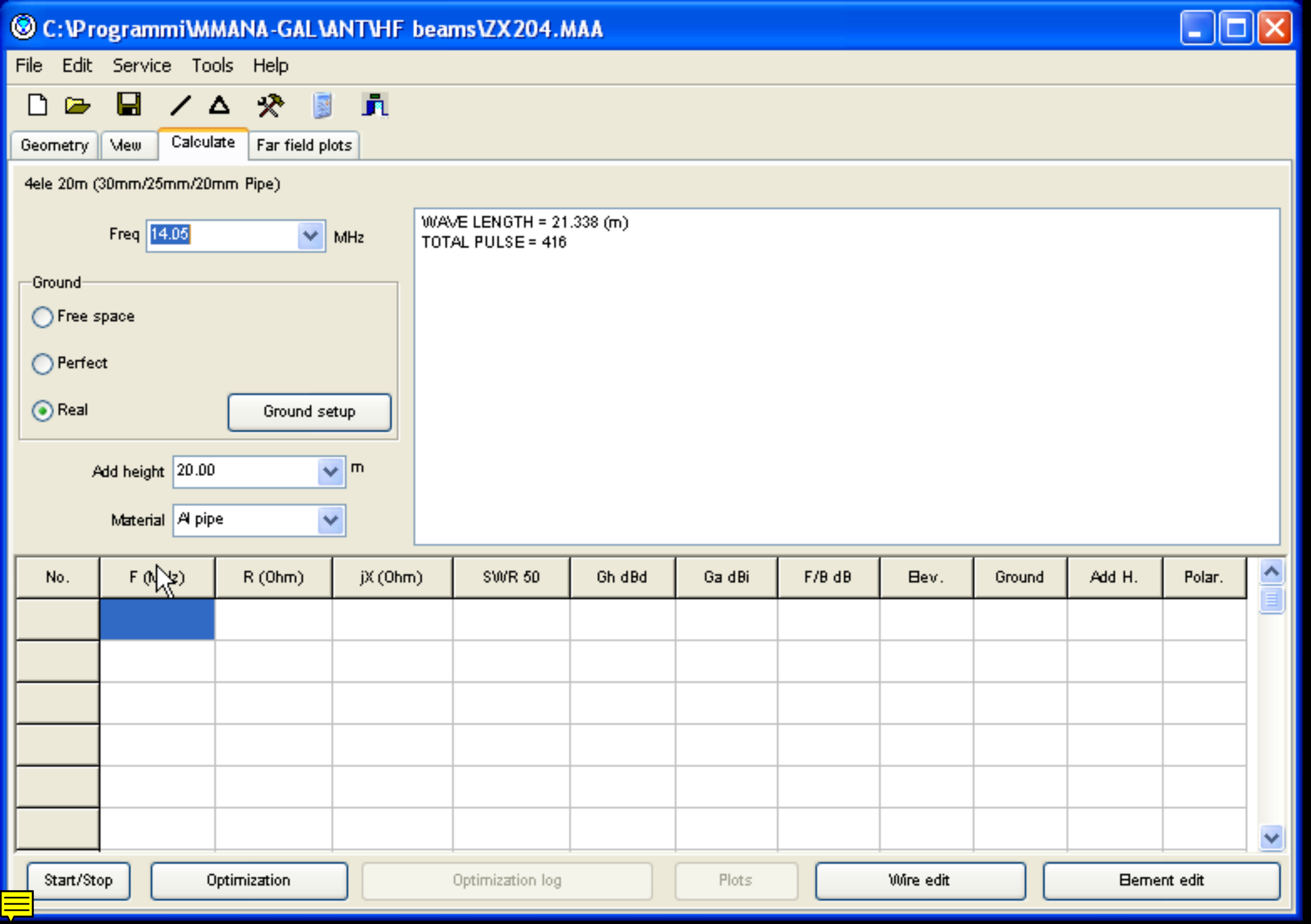
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Geometry View Calculate Far field plots
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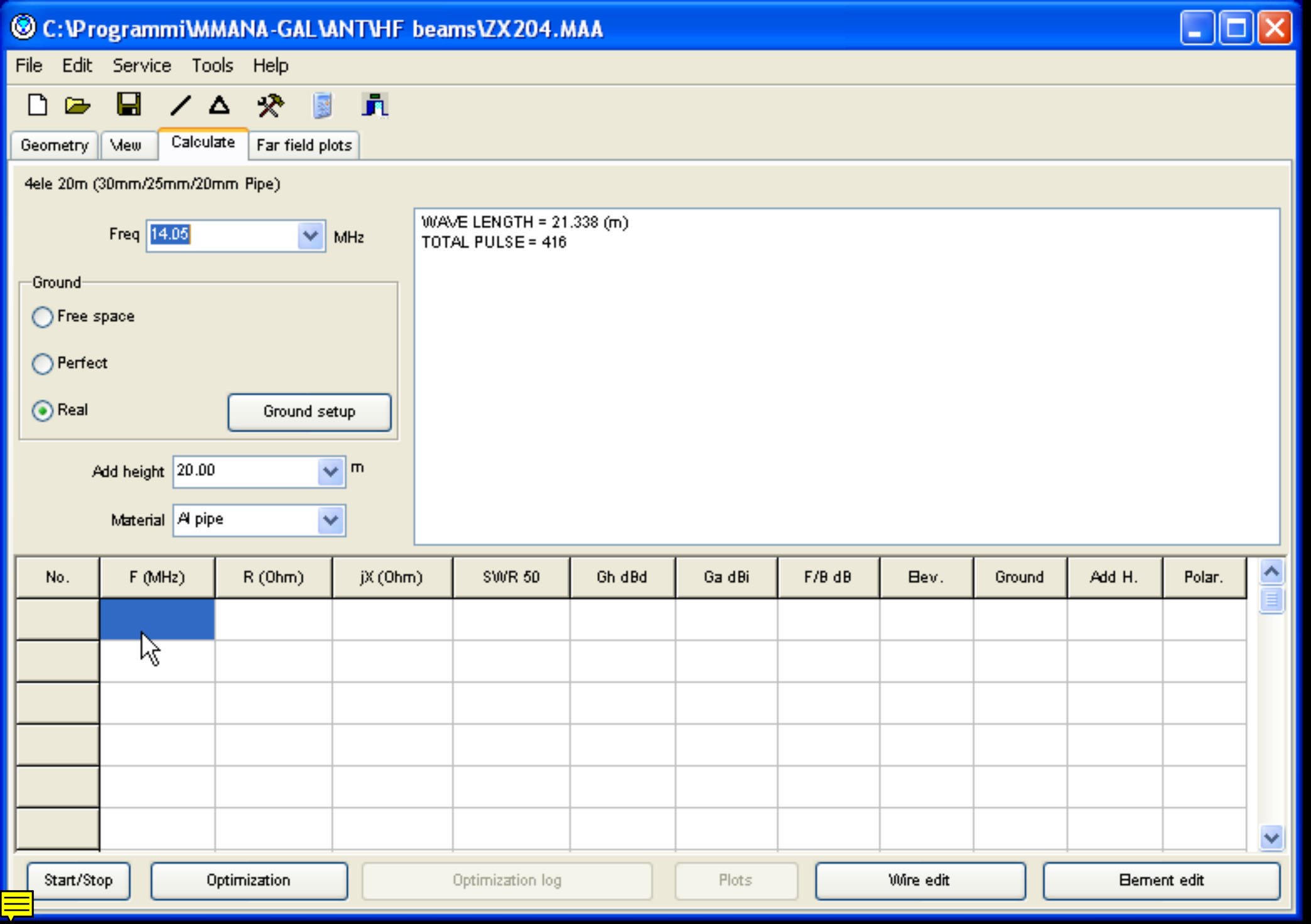
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Ground setup
Add height 20.00 m
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TOTAL PULSE = 416
No. F (MHz) R (Ohm) jX (Ohm) SWR 50 Gh dBd Ga dBi F/B dB Elev. Ground Add H. Polar.
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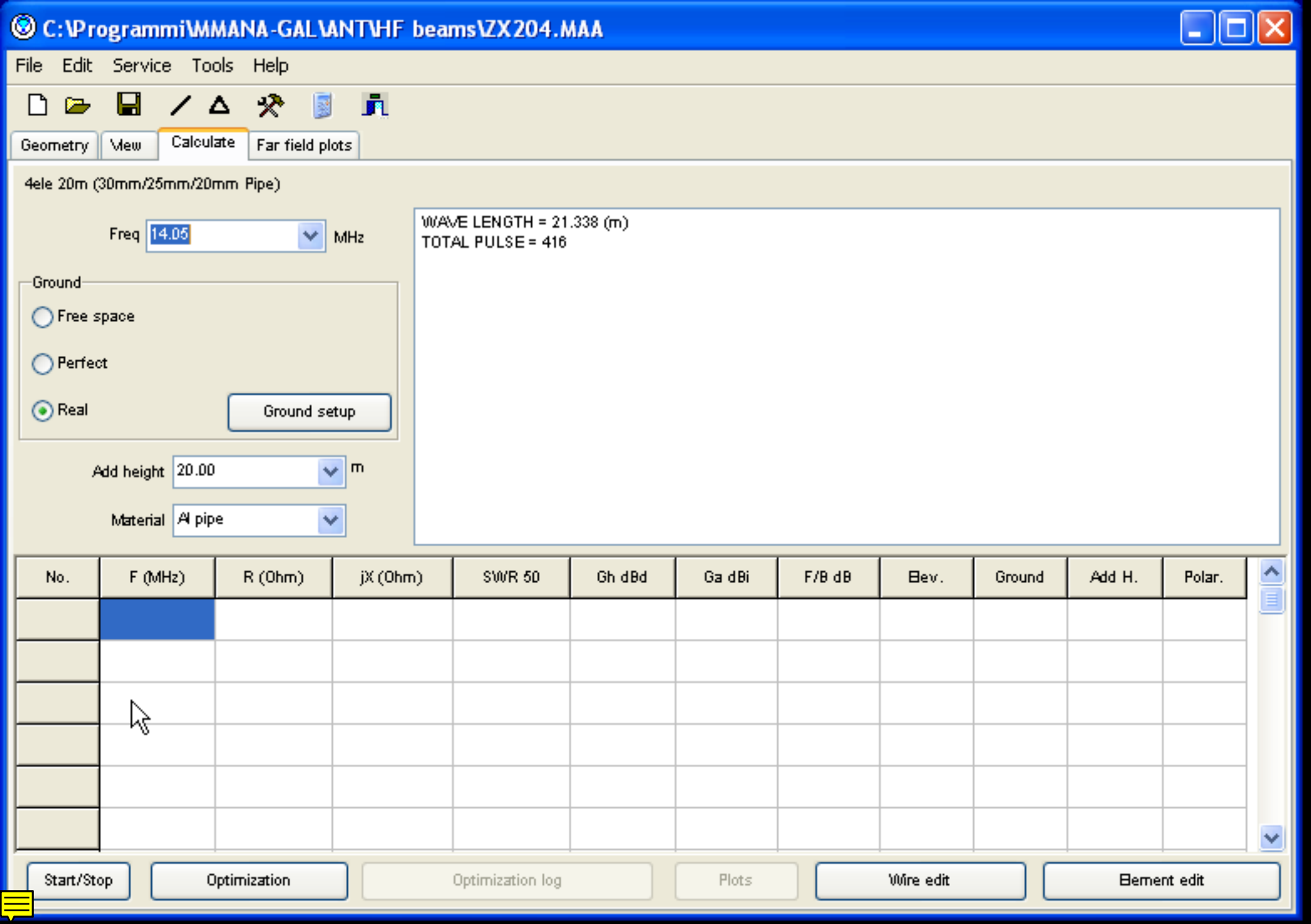
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Ground setup
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Material Al pipe
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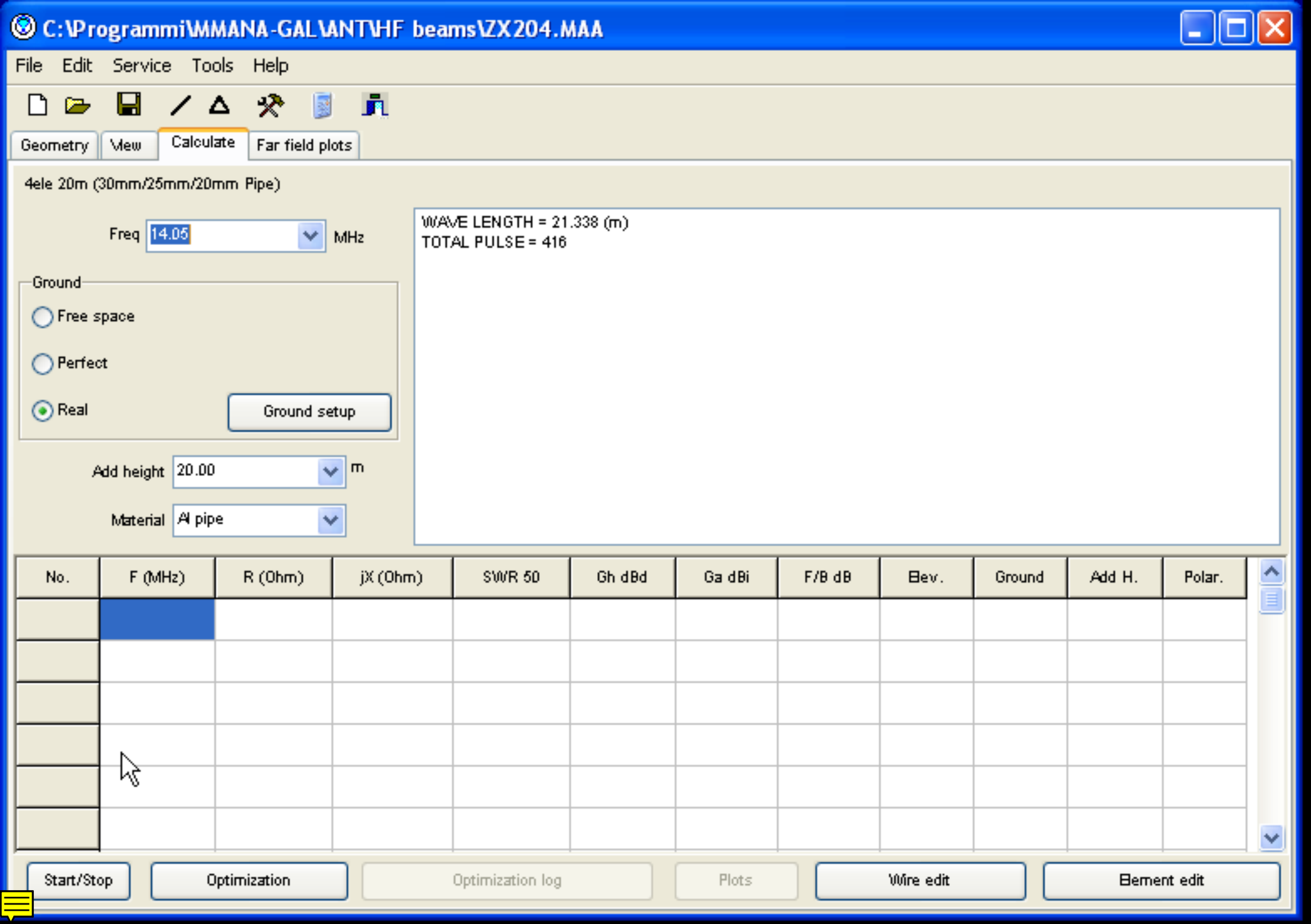
TOTAL PULSE = 416
No. F (MHz) R (Ohm) jX (Ohm) SWR 50 Gh dBd Ga dBi F/B dB Elev. Ground Add H. Polar.
Start/Stop Optimization Optimization log Plots Wire edit Element edit


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File Edit Service Tools Help
Geometry View Calculate Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
Freq 14.05 MHz
Ground
Free space
Perfect
Real
Ground setup
Add height 20.00 m
Material Al pipe
WAVE LENGTH = 21.338 (m)
TOTAL PULSE = 416
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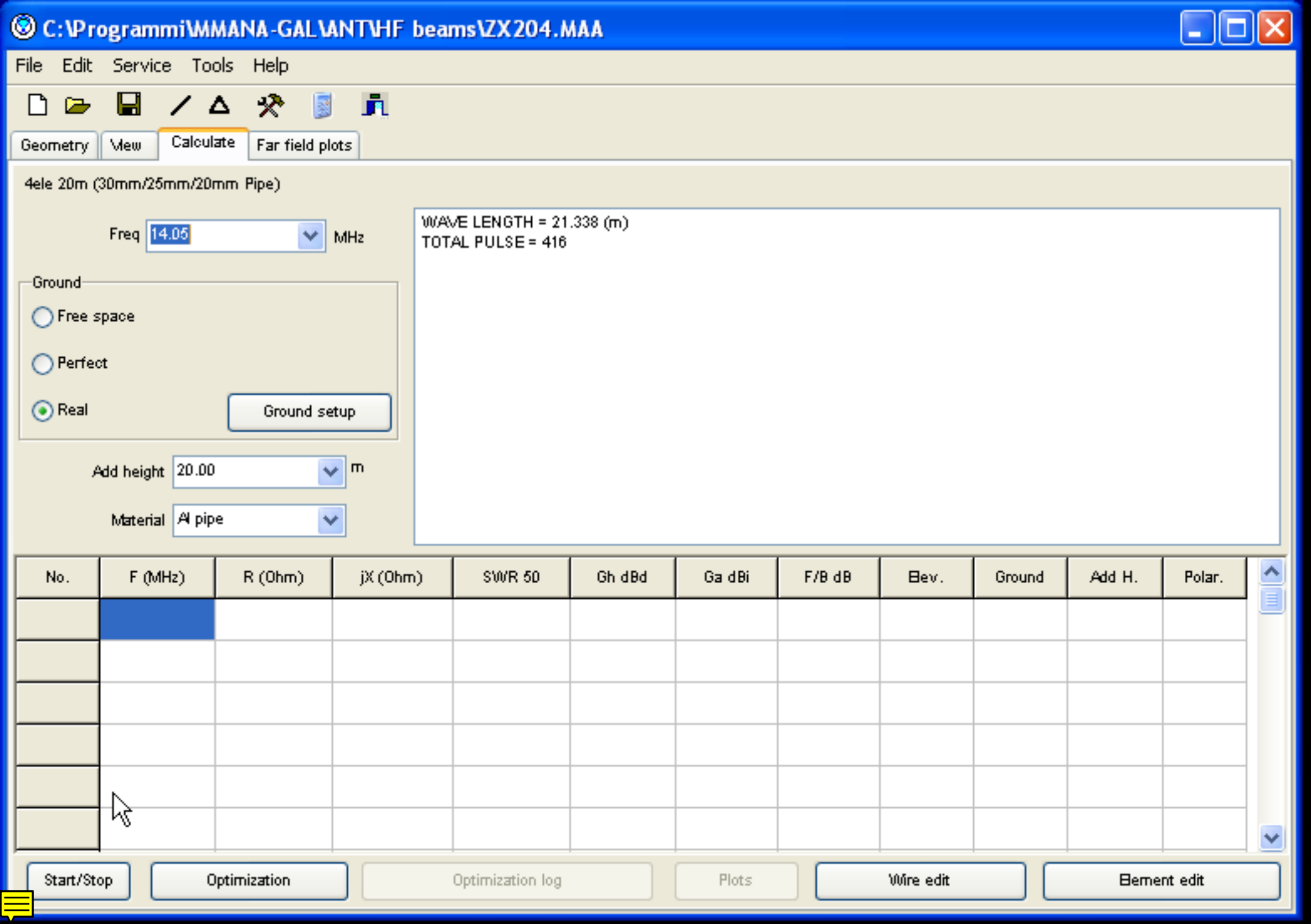
Start/Stop Optimization Optimization log Plots Wire edit Element edit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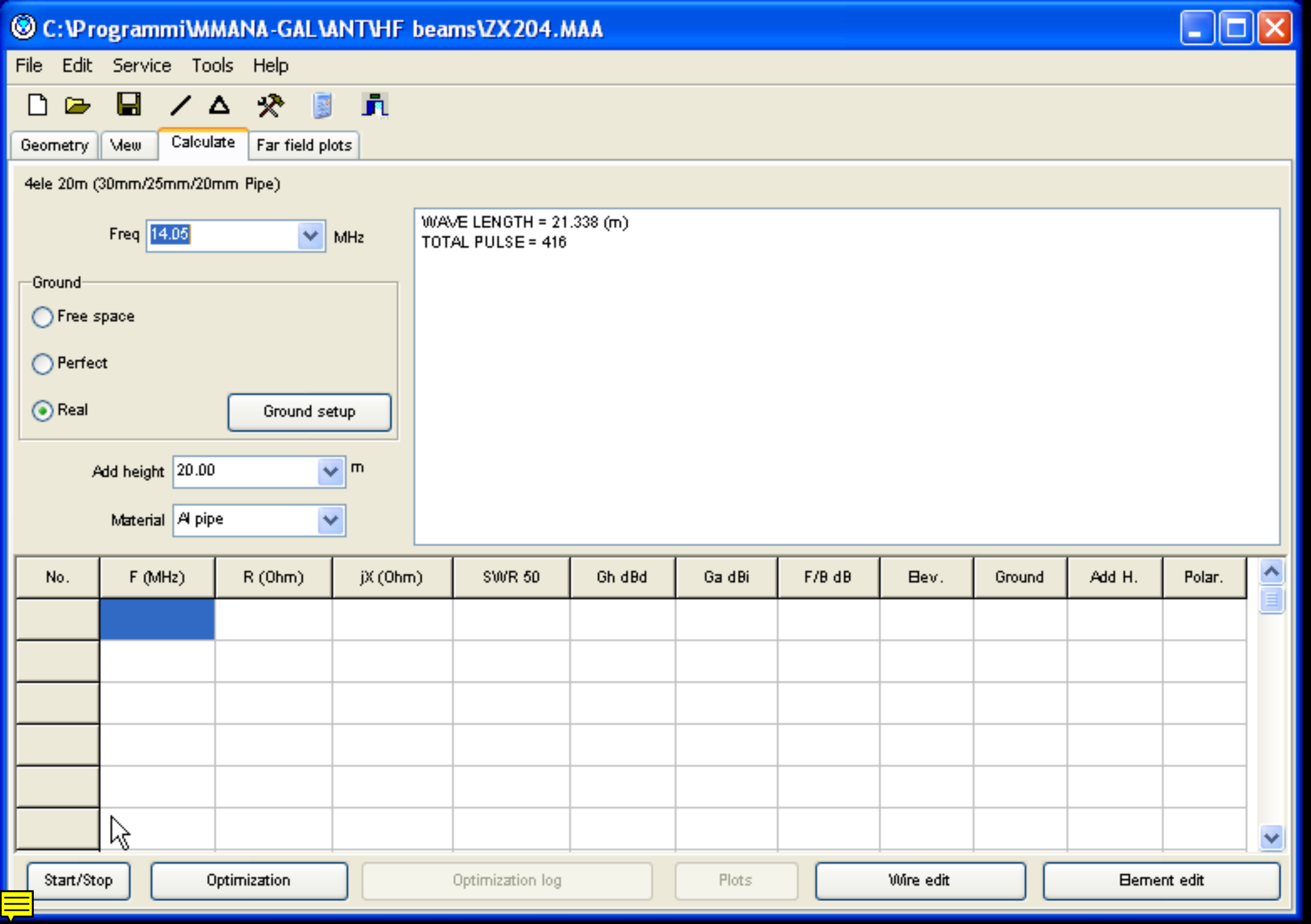
Start/Stop Optimization Optimization log Plots Wire edit Element edit


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
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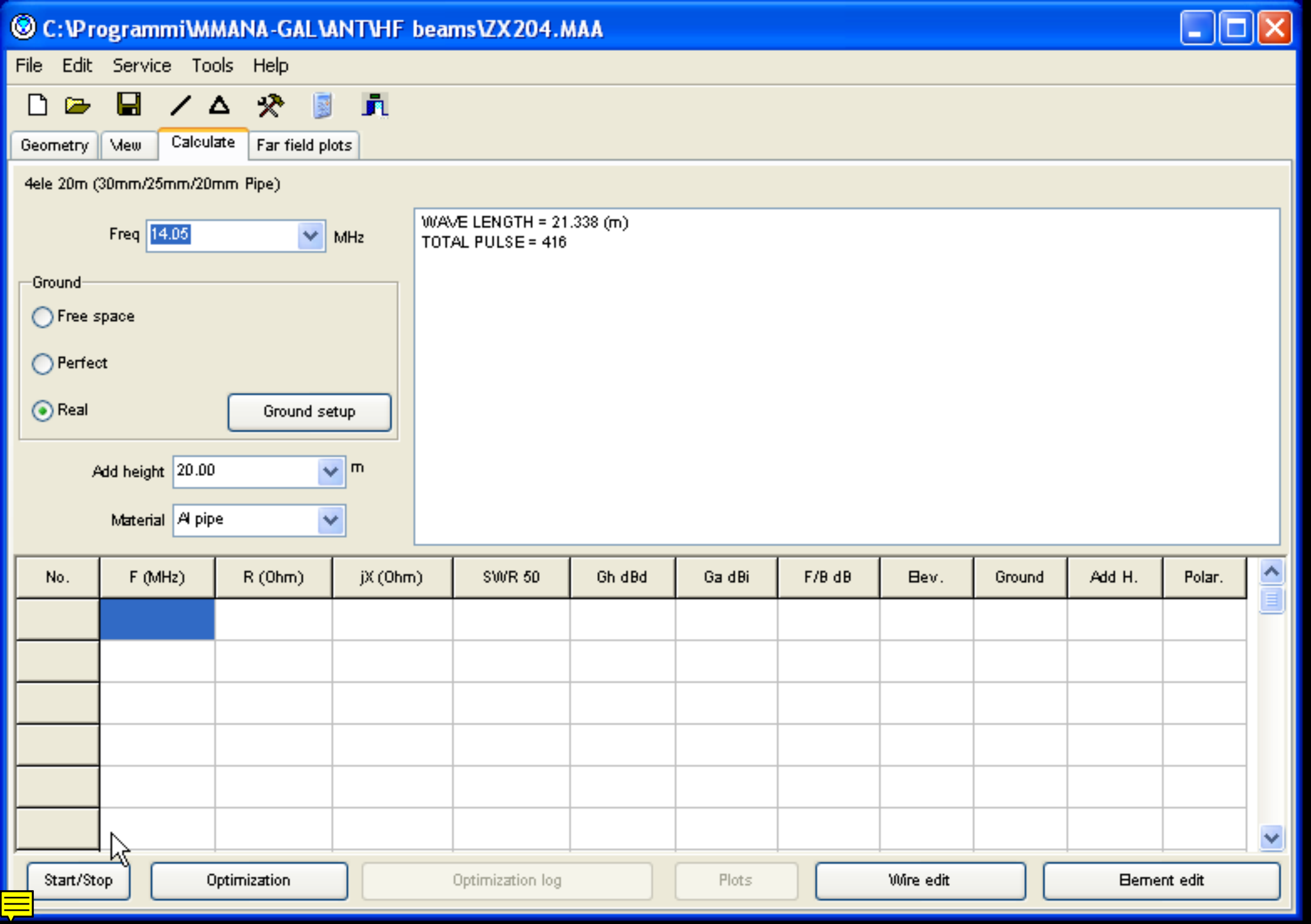
C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
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Geometry View Calculate Far field plots
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Freq 14.05 MHz
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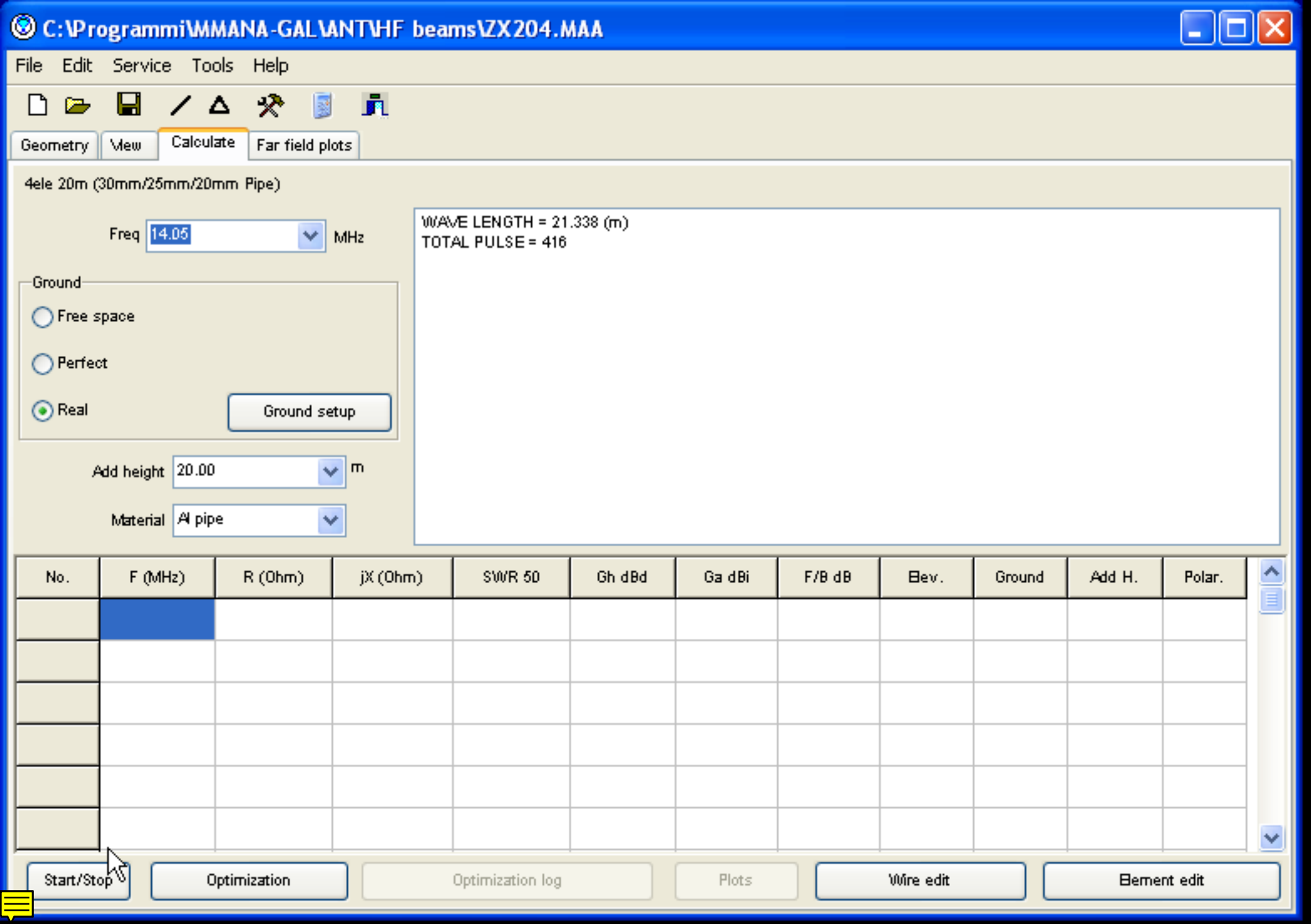
C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File Edit Service Tools Help
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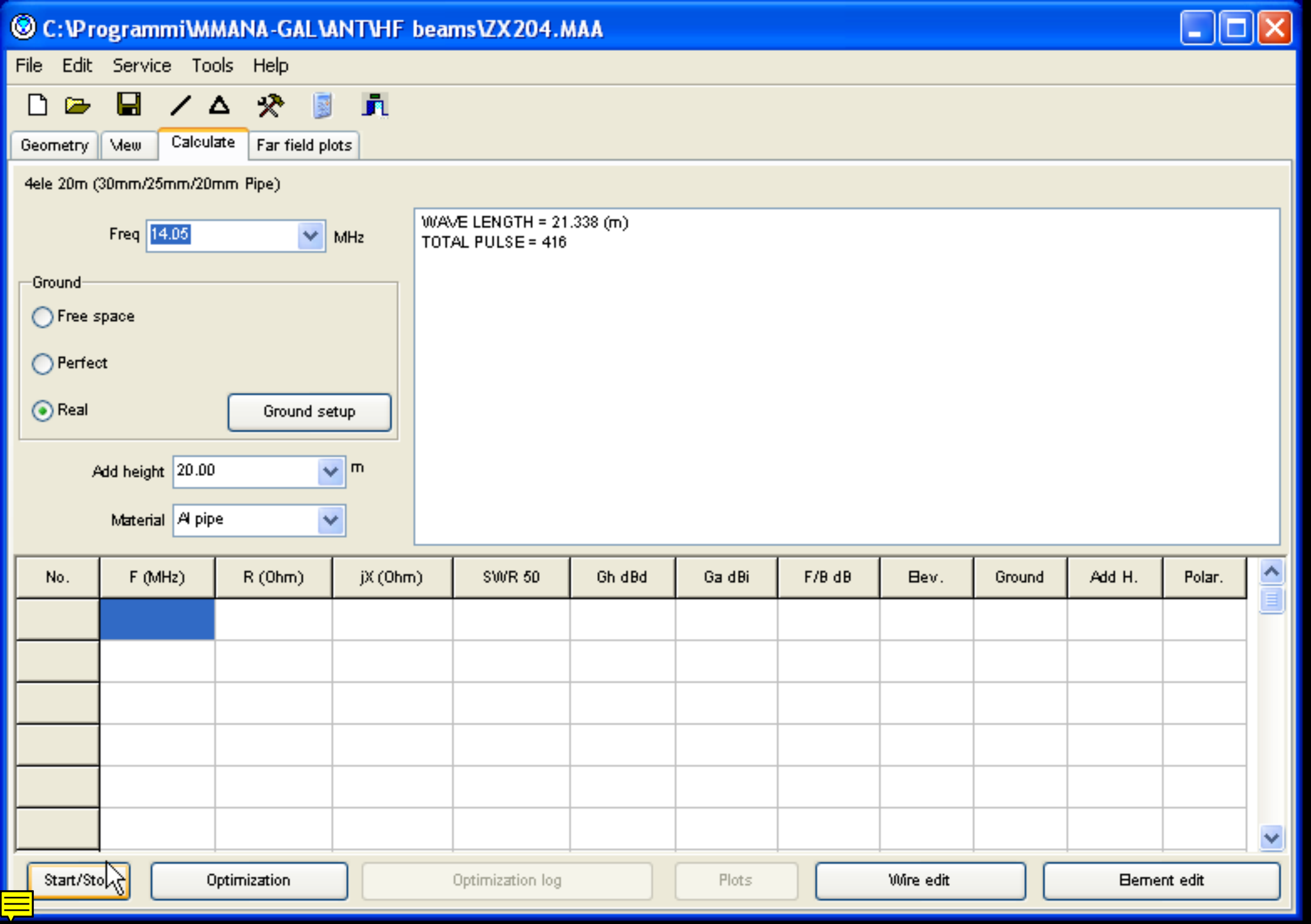
No. F (MHz) R (Ohm) jX (Ohm) SWR 50 Gh dBd Ga dBi F/B dB Elev. Ground Add H. Polar.
Start/Stop Optimization Optimization log Plots Wire edit Element edit


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
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Geometry
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Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
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14.05
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Free space
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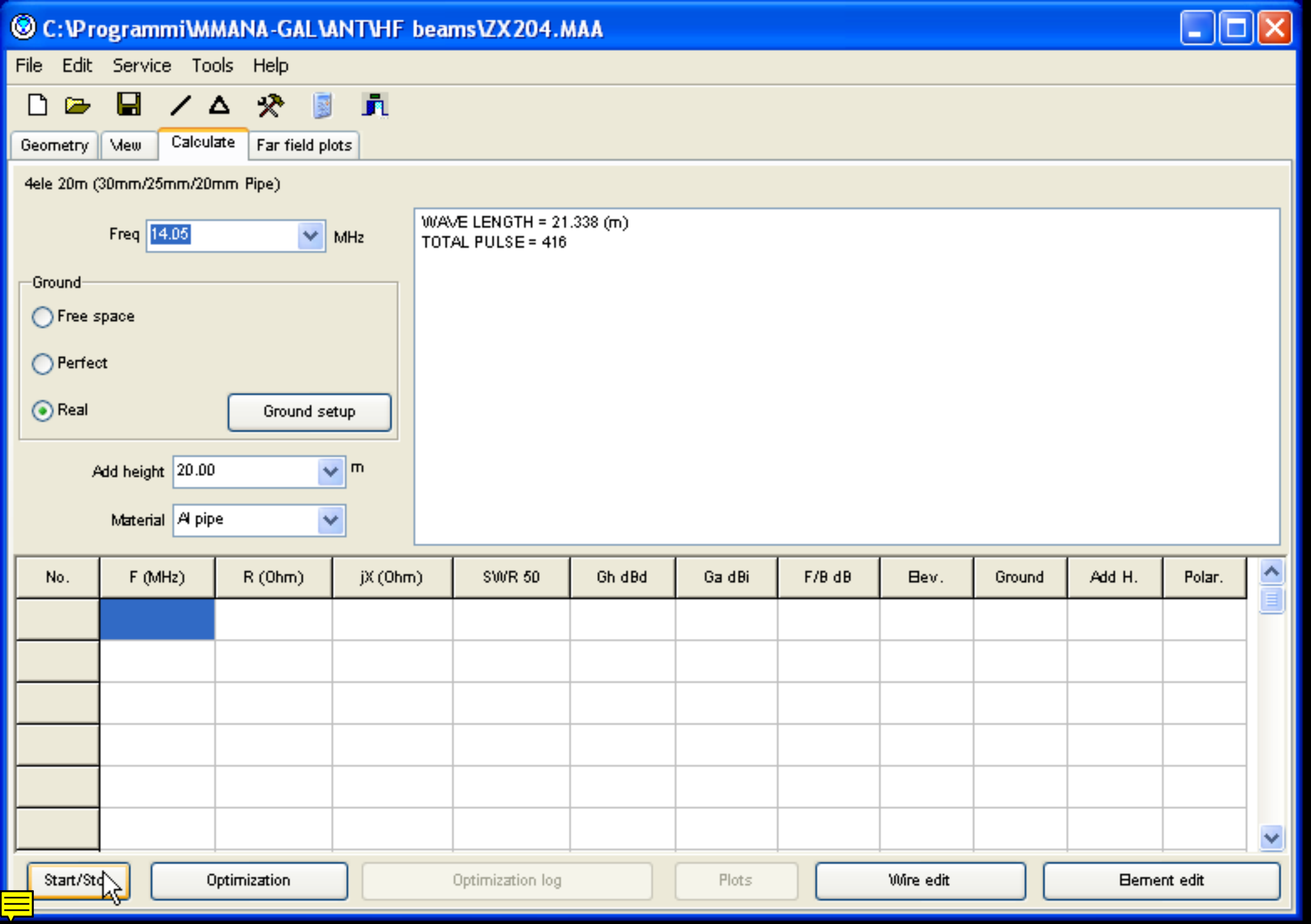
Add height
20.00
m
Material
Al pipe
WAVE LENGTH = 21.338 (m)
TOTAL PULSE = 416
No.
F (MHz)
R (Ohm)
jX (Ohm)
SWR 50
Gh dBd
Ga dBi
F/B dB
Elev.
Ground
Add H.
Polar.
Start/Sto
Optimization
Optimization log
Plots
Wire edit
Element edit


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
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SWR 50
Gh dBd
Ga dBi
F/B dB
Elev.
Ground
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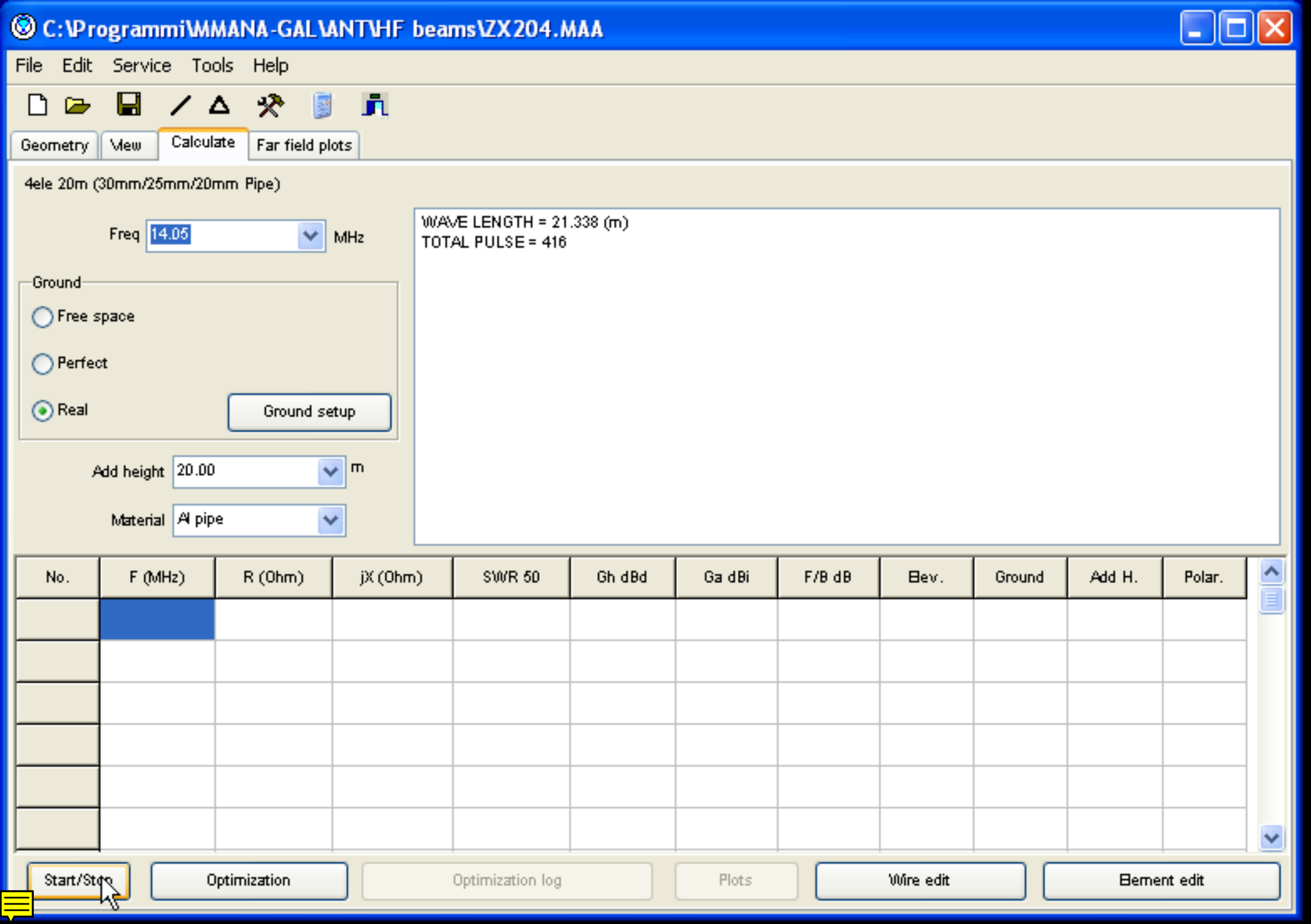
Polar.
Start/Sto
Optimization
Optimization log
Plots
Wire edit
Element edit


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
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Geometry View Calculate Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
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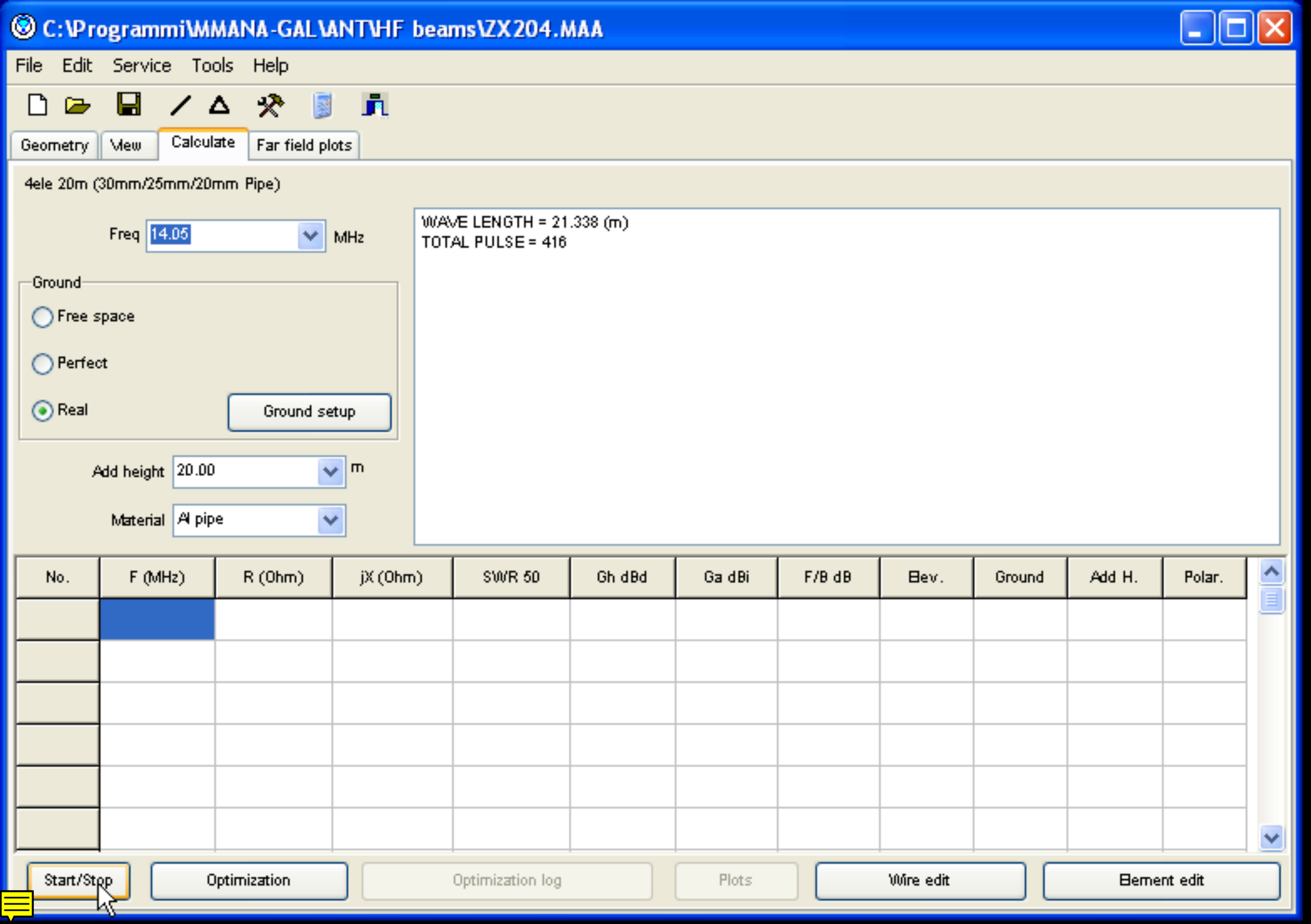
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
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Geometry View Calculate Far field plots
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Freq 14.05 MHz
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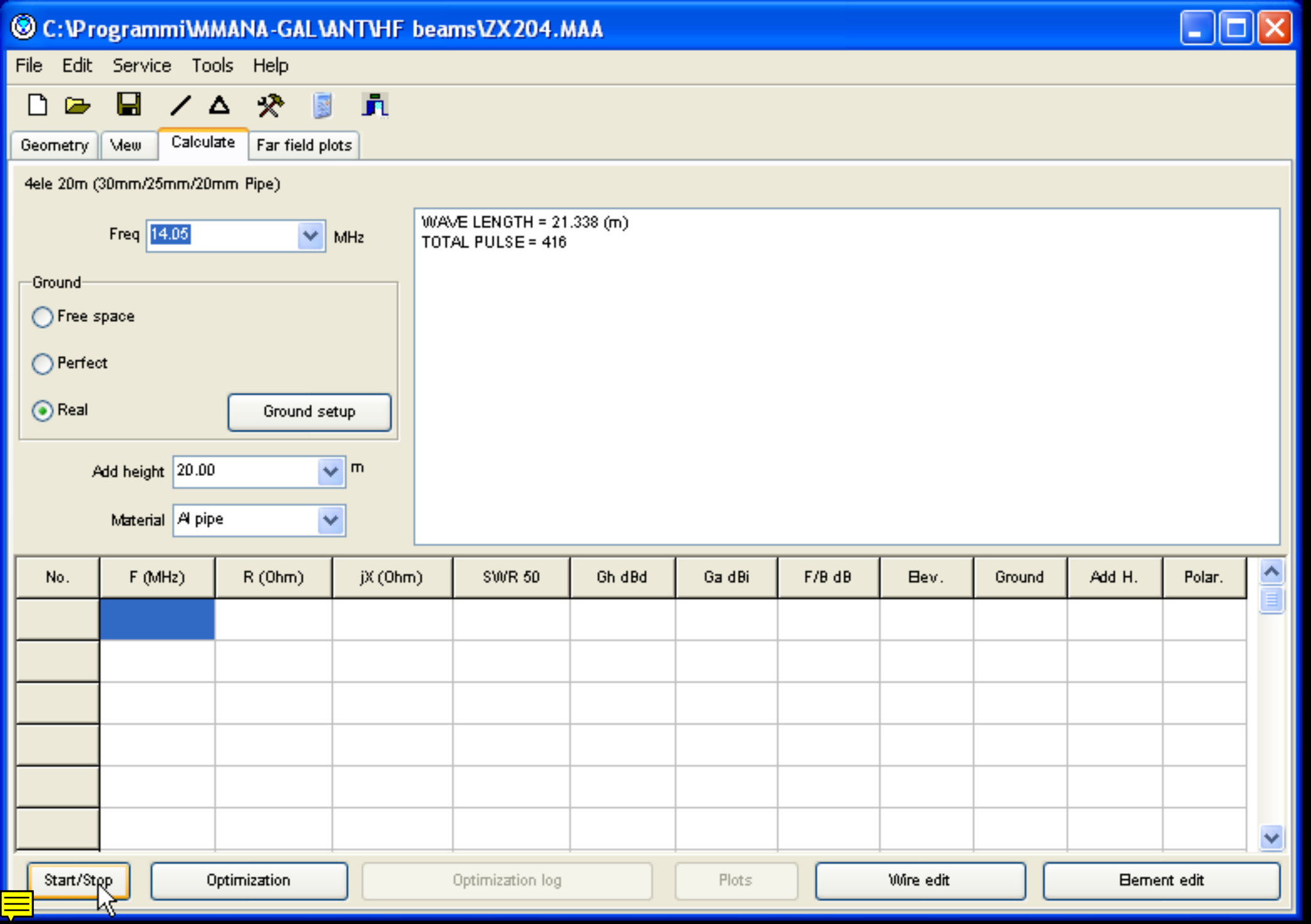
Start/Stop Optimization Optimization log Plots Wire edit Element edit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File Edit Service Tools Help
Geometry View Calculate Far field plots
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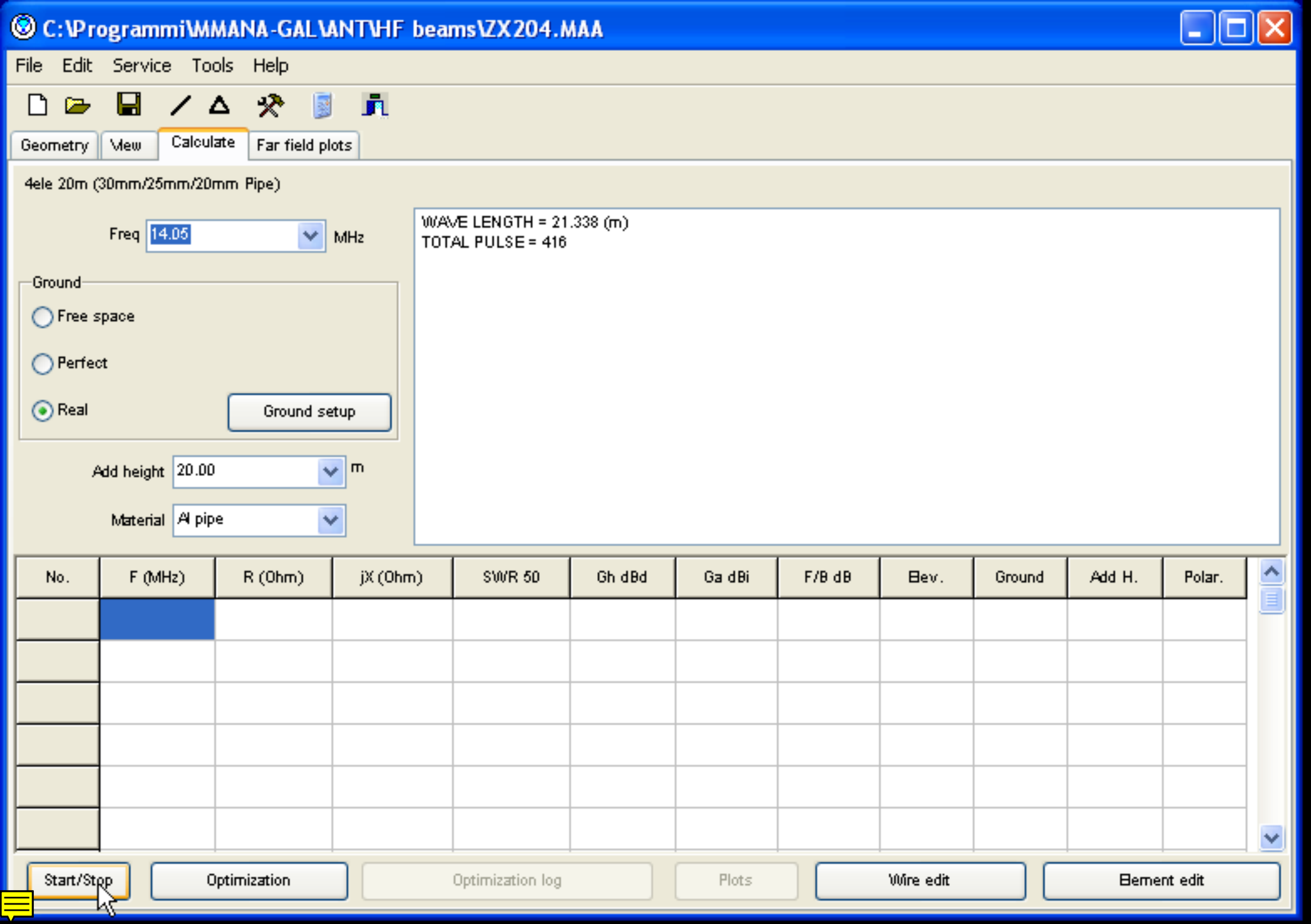
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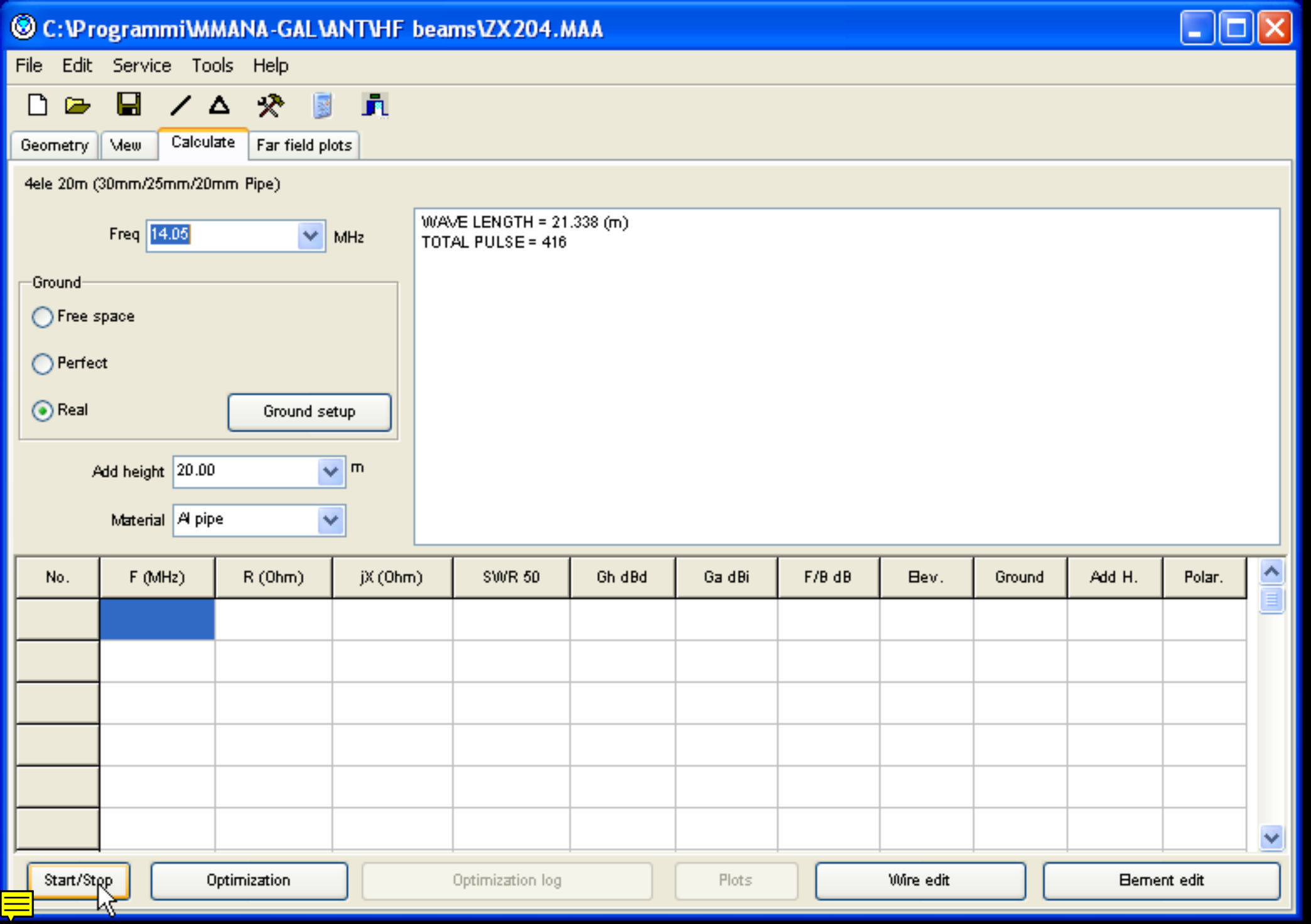
C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
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Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
Freq
14.05
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20.00
m
Material
Al pipe
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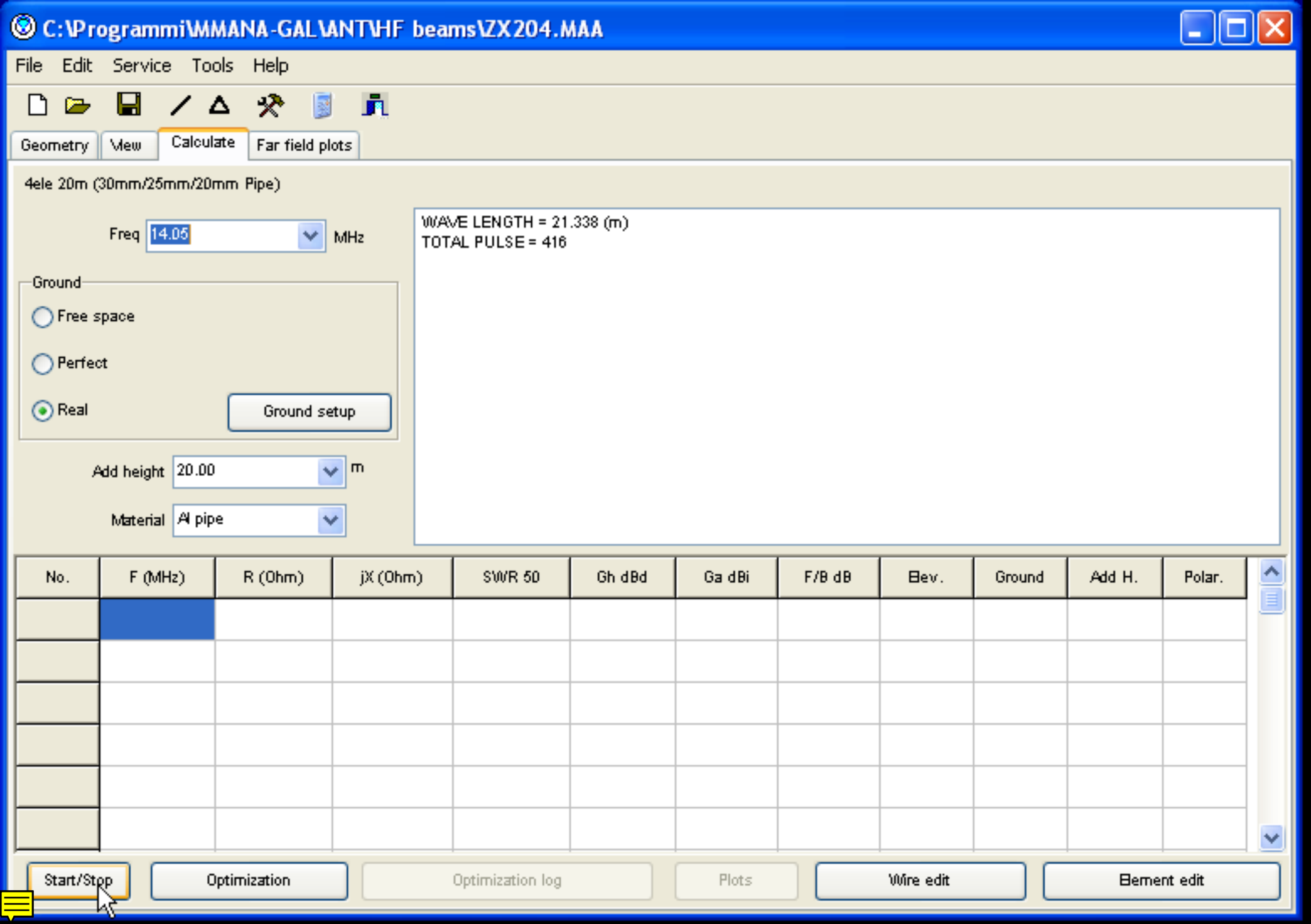
No.
F (MHz)
R (Ohm)
jX (Ohm)
SWR 50
Gh dBd
Ga dBi
F/B dB
Elev.
Ground
Add H.
Polar.
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
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Geometry View Calculate Far field plots
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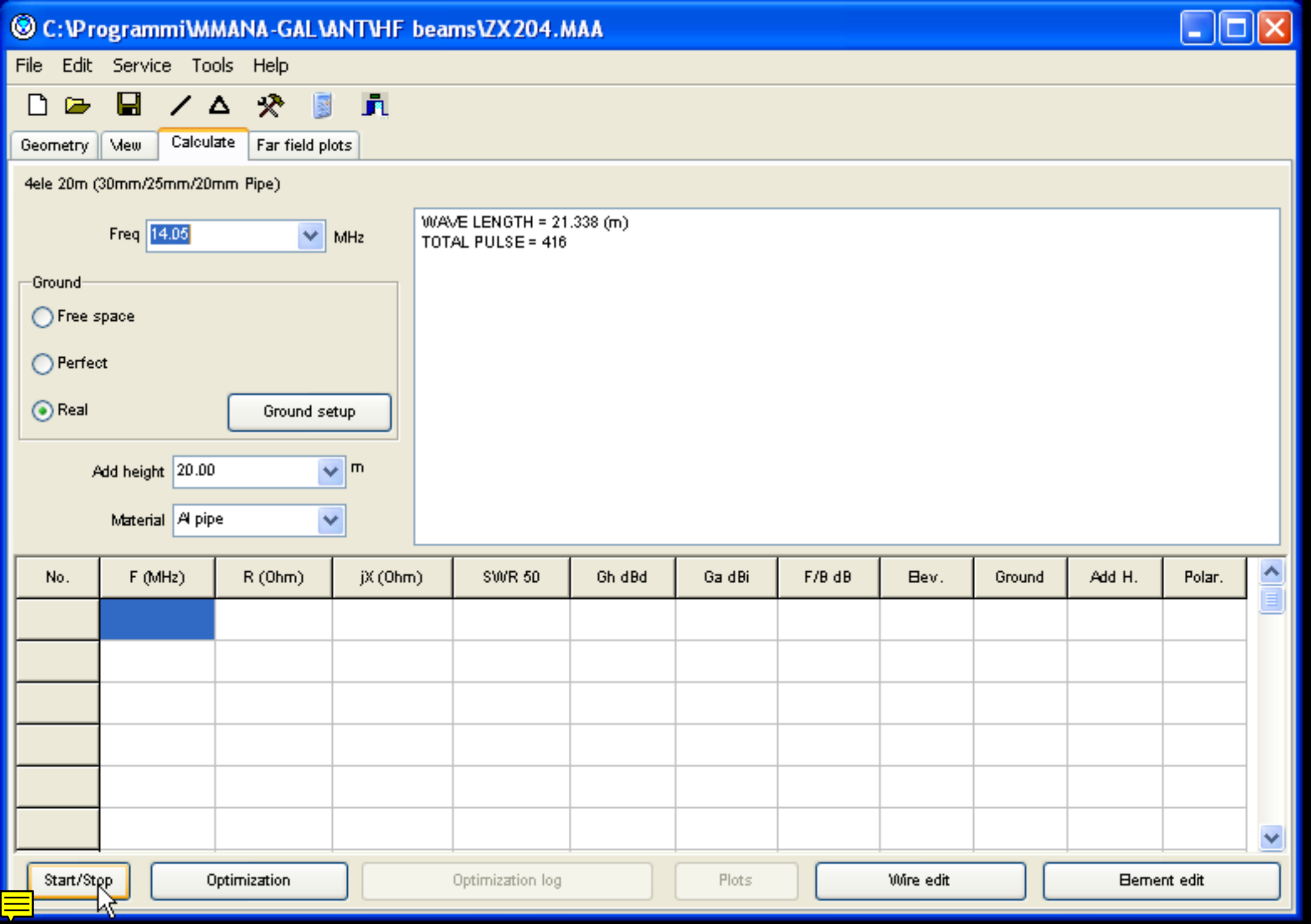
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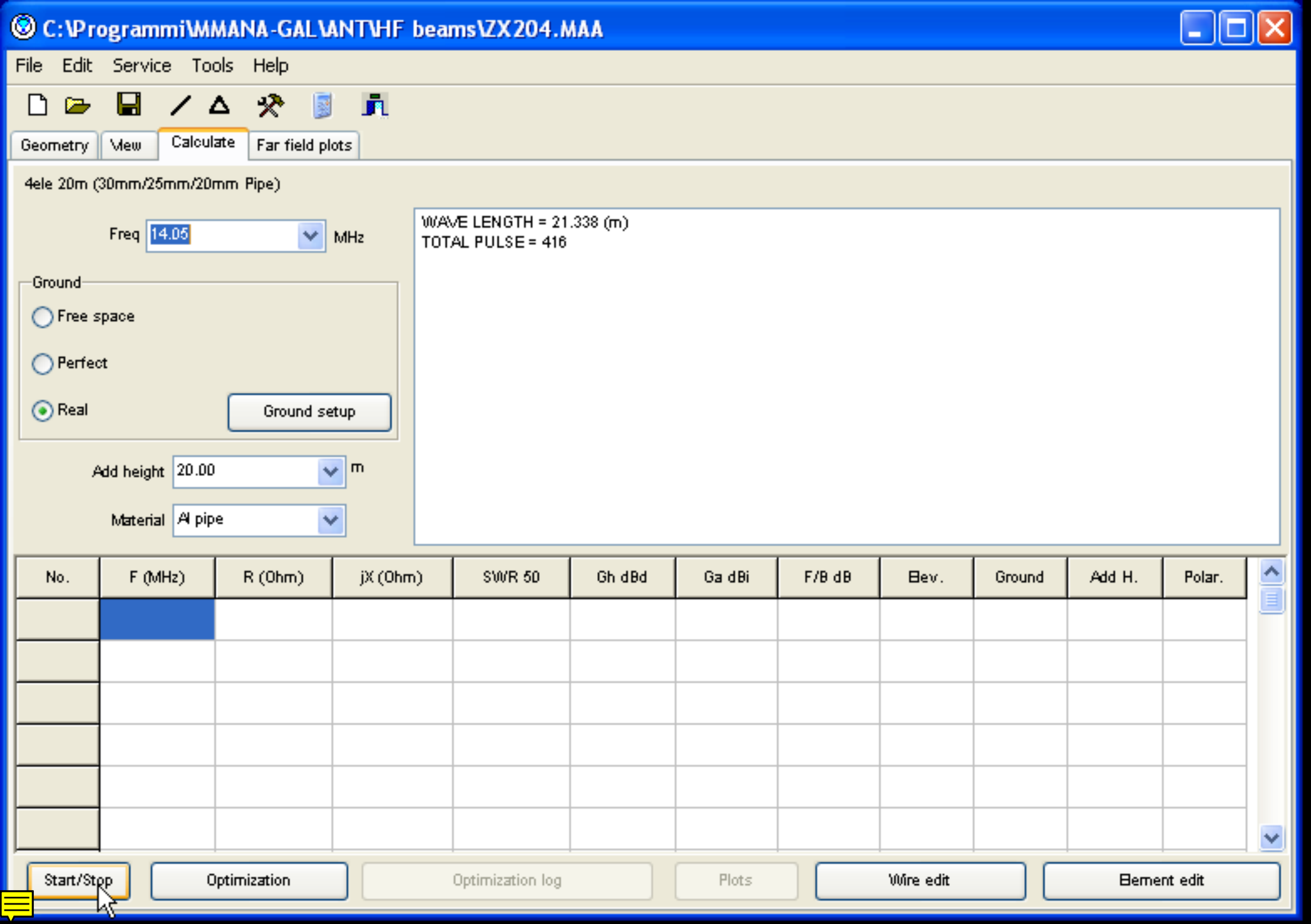
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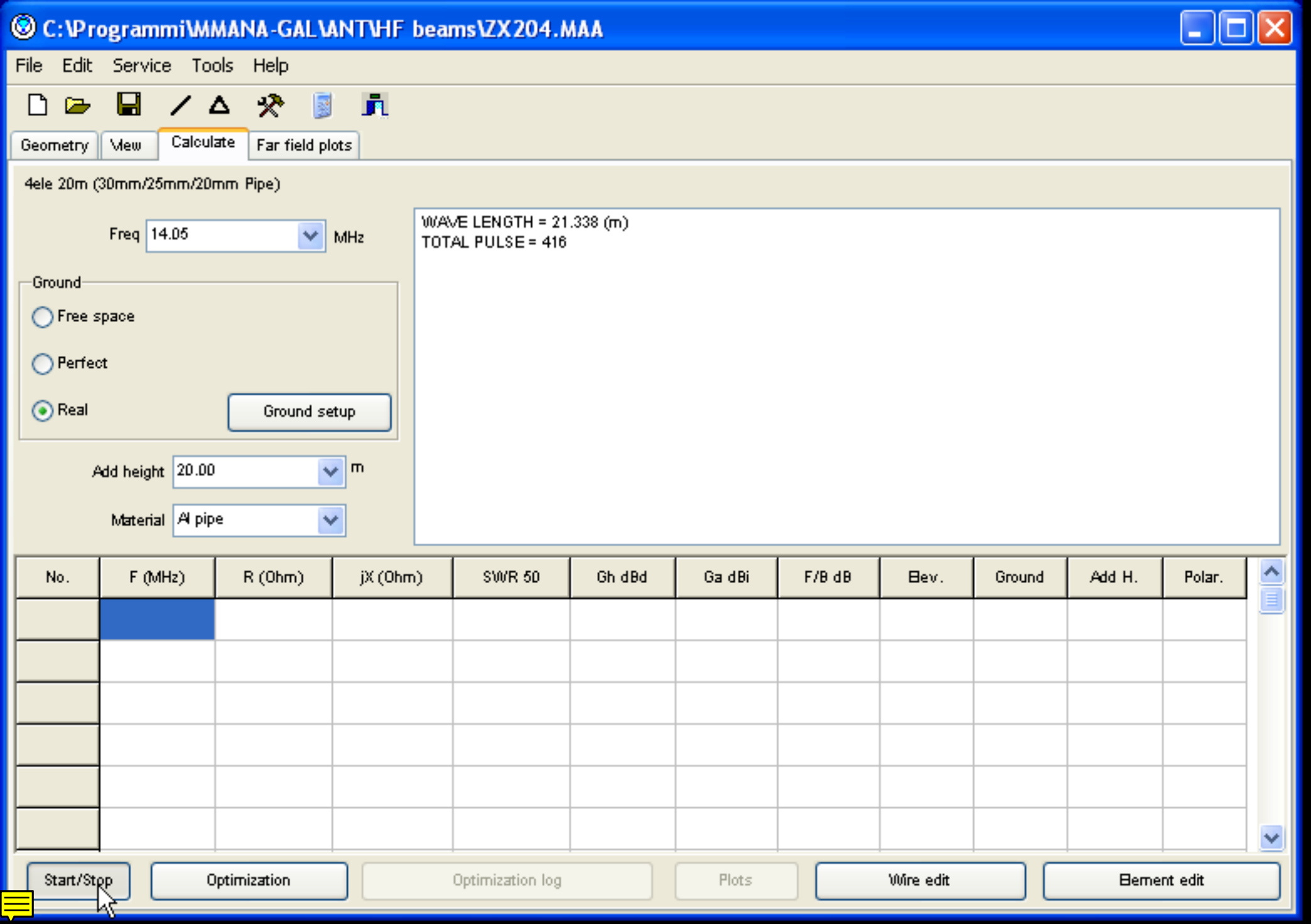
C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File Edit Service Tools Help
Geometry View Calculate Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
Freq 14.05 MHz
Ground
Free space
Perfect
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Ground setup
Add height 20.00 m
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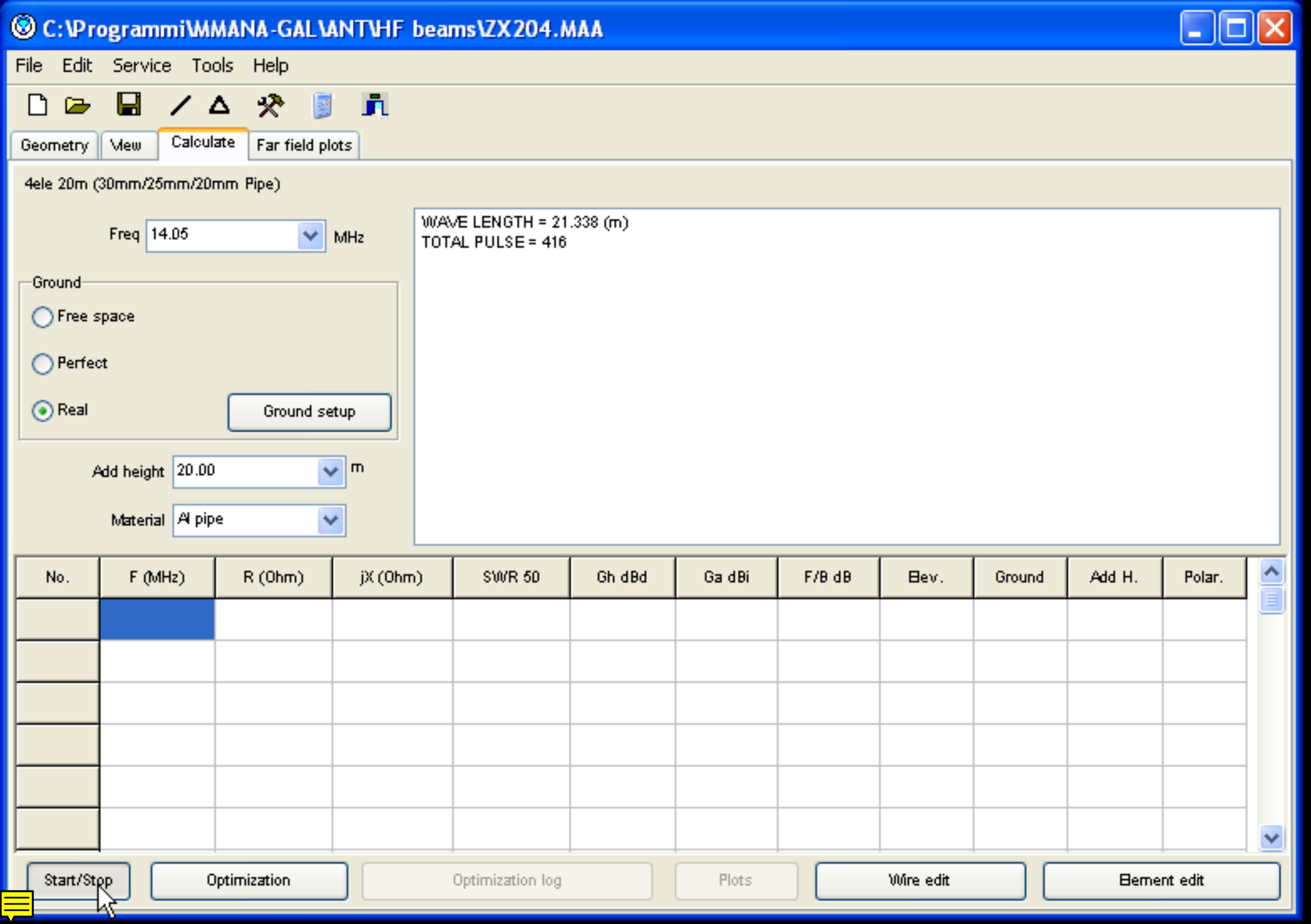
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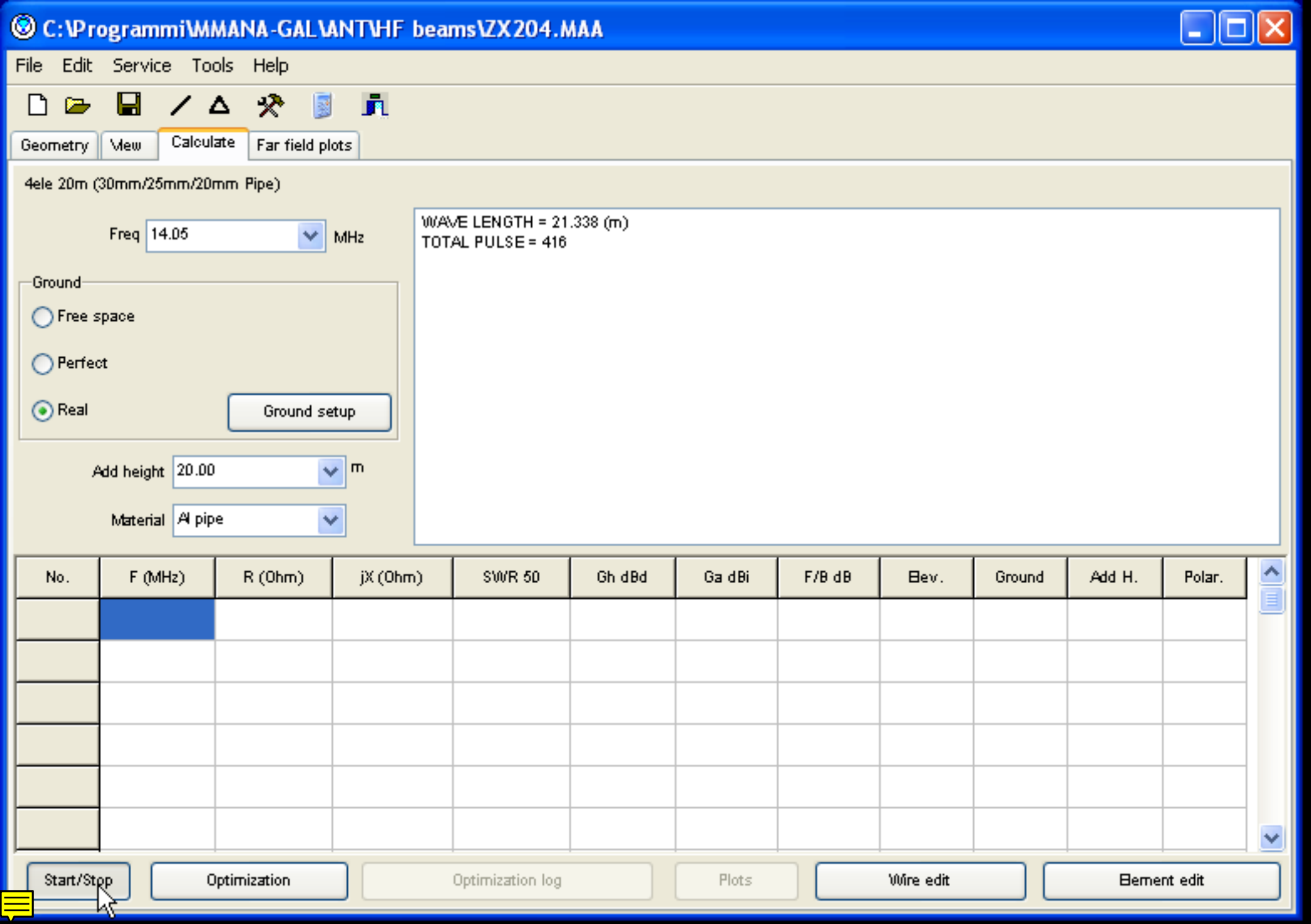
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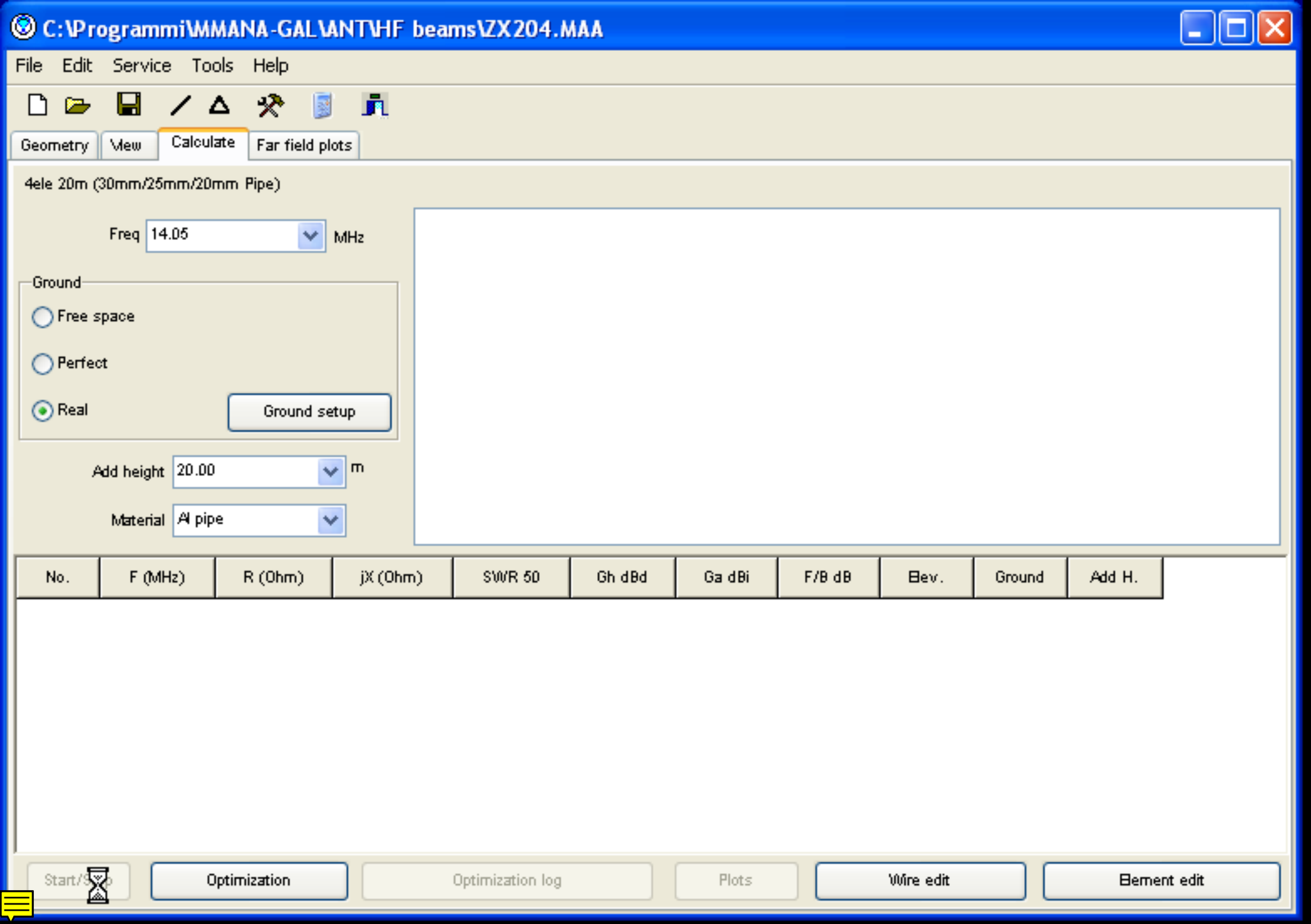
C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File
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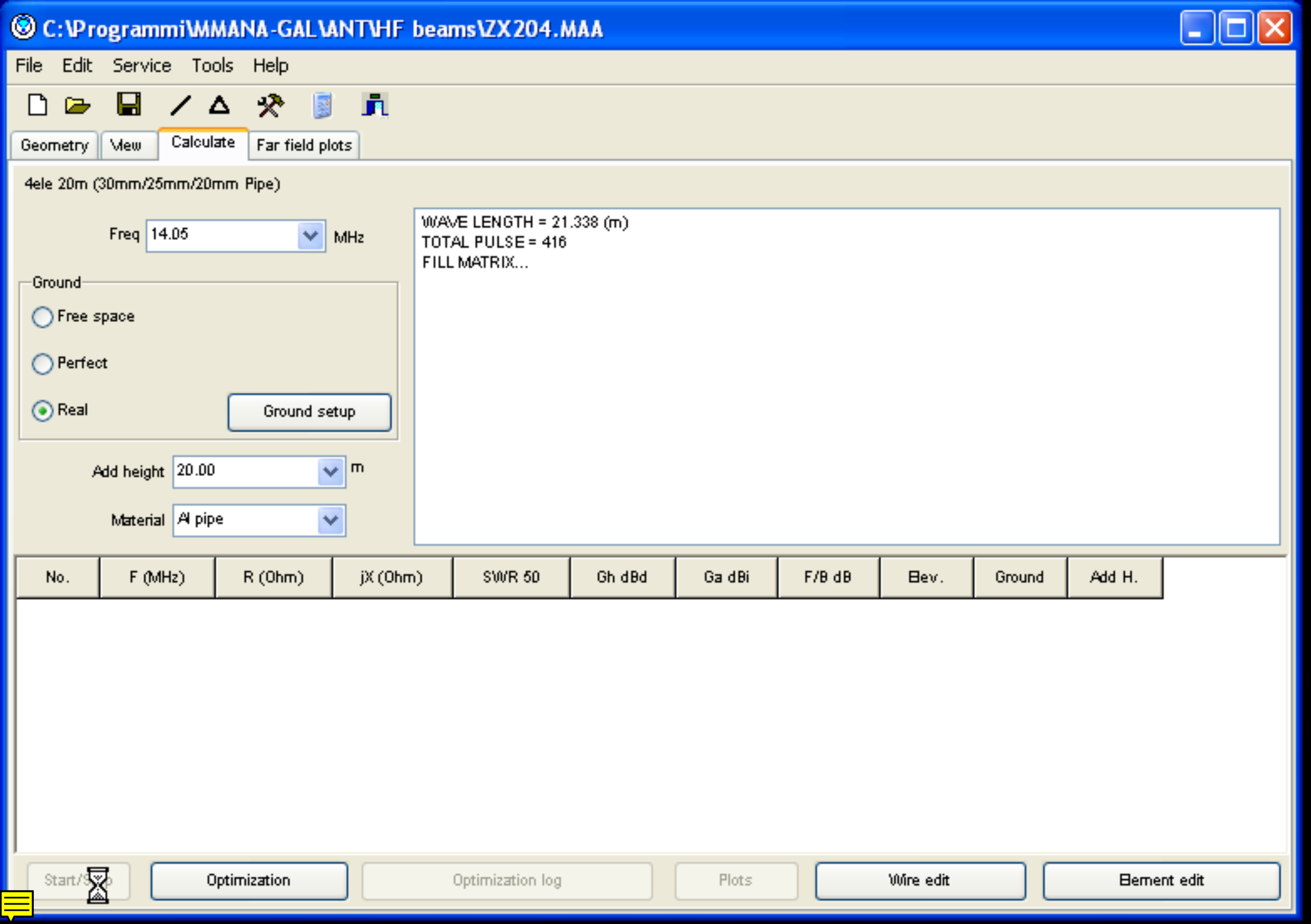
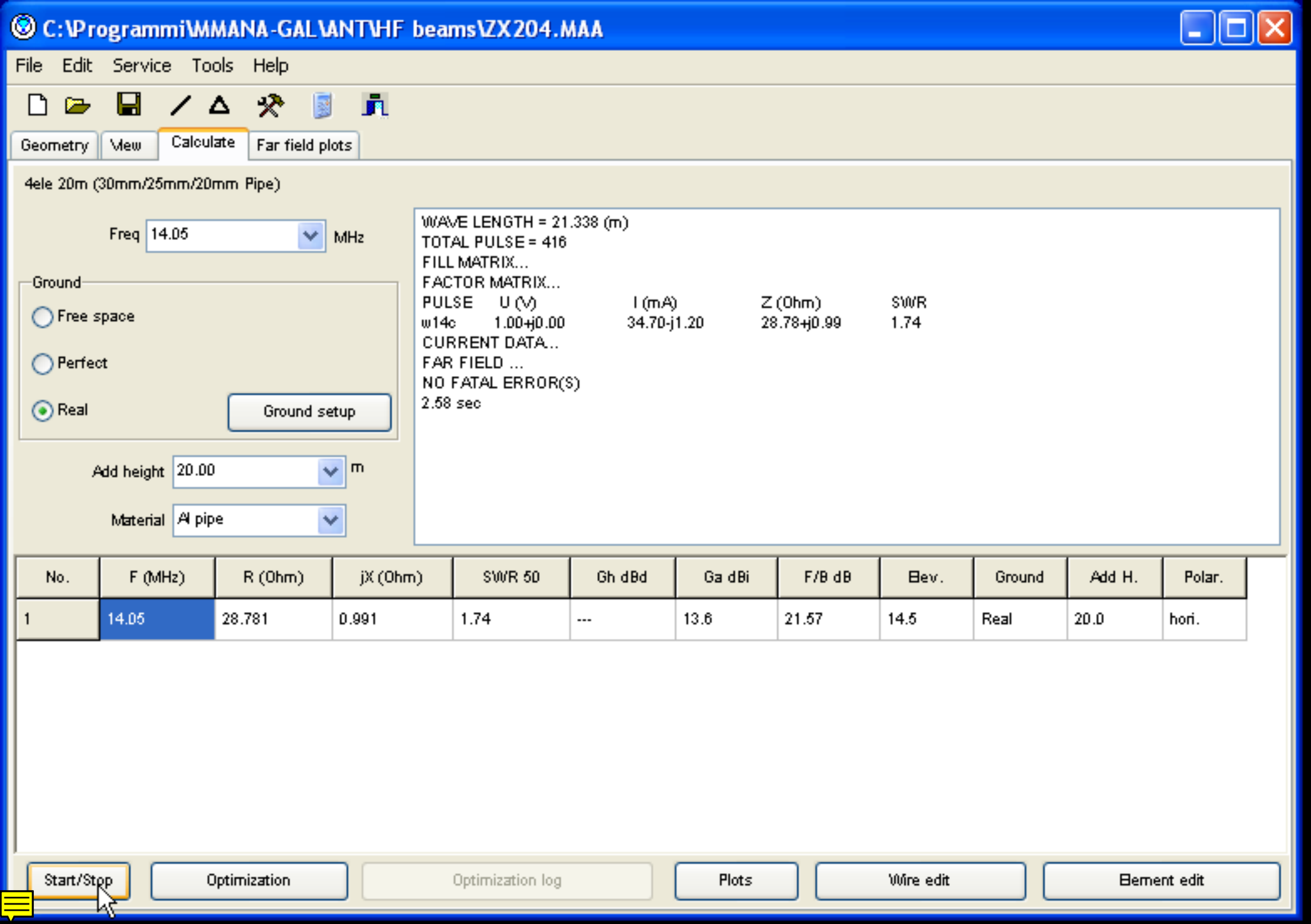
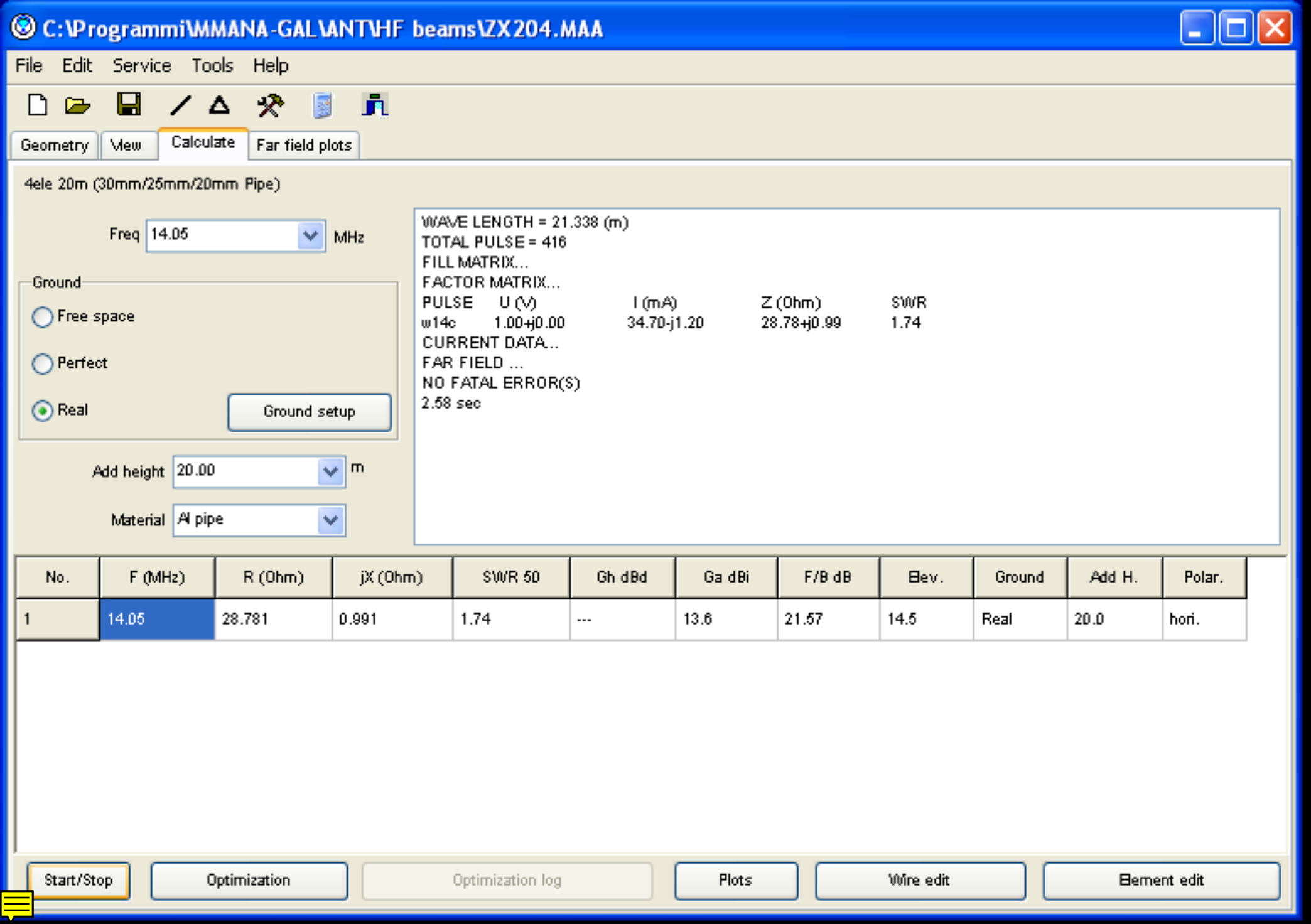
Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
Freq
14.05
MHz
Ground
Free space
Perfect
Real
Ground setup
Add height
20.00
m
Material
Al pipe
No.
F (MHz)
R (Ohm)
jX (Ohm)
SWR 50
Gh dBd
Ga dBi
F/B dB
Elev.
Ground
Add H.
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File Edit Service Tools Help
Geometry View Calculate Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
Freq 14.05 MHz
Ground
Free space
Perfect
Real
Ground setup
Add height 20.00 m
Material Al pipe
WAVE LENGTH = 21.338 (m)
TOTAL PULSE = 416
FILL MATRIX...
No. F (MHz) R (Ohm) jX (Ohm) SWR 50 Gh dBd Ga dBi F/B dB Elev. Ground Add H.
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File Edit Service Tools Help
Geometry View Calculate Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
Freq 14.05 MHz
Ground
Free space
Perfect
Real
Ground setup
Add height 20.00 m
Material Al pipe
WAVE LENGTH = 21.338 (m)
TOTAL PULSE = 416
FILL MATRIX...
FACTOR MATRIX...
PULSE U (V) I (mA) Z (Ohm) SWR
w14c 1.00+j0.00 34.70-j1.20 28.78+j0.99 1.74
CURRENT DATA...
FAR FIELD ...
NO FATAL ERROR(S)
2.58 sec
No. F (MHz) R (Ohm) jX (Ohm) SWR 50 Gh dBd Ga dBi F/B dB Elev. Ground Add H. Polar.
1 14.05 28.781 0.991 1.74 --- 13.6 21.57 14.5 Real 20.0 hori.
Start/Stop Optimization Optimization log Plots Wire edit Element edit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Geometry View Calculate Far field plots
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Add height 20.00 m
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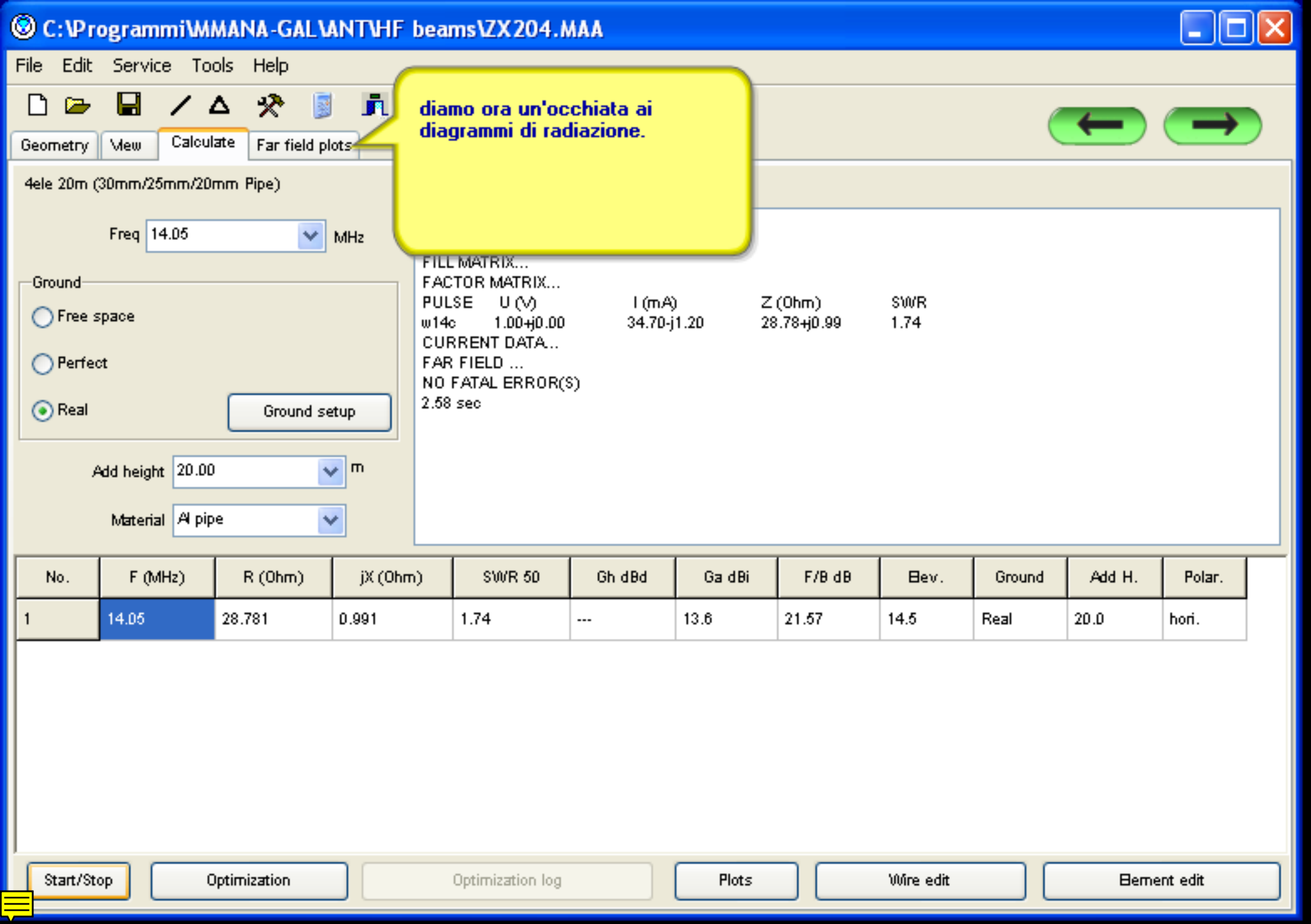
FILL MATRIX...
FACTOR MATRIX...
PULSE U (V) I (mA) Z (Ohm) SWR
w14c 1.00+j0.00 34.70-j1.20 28.78+j0.99 1.74
CURRENT DATA...
FAR FIELD ...
NO FATAL ERROR(S)
2.58 sec
No. F (MHz) R (Ohm) jX (Ohm) SWR 50 Gh dBd Ga dBi F/B dB Elev. Ground Add H. Polar.
1 14.05 28.781 0.991 1.74 --- 13.6 21.57 14.5 Real 20.0 hori.
Start/Stop Optimization Optimization log Plots Wire edit Element edit

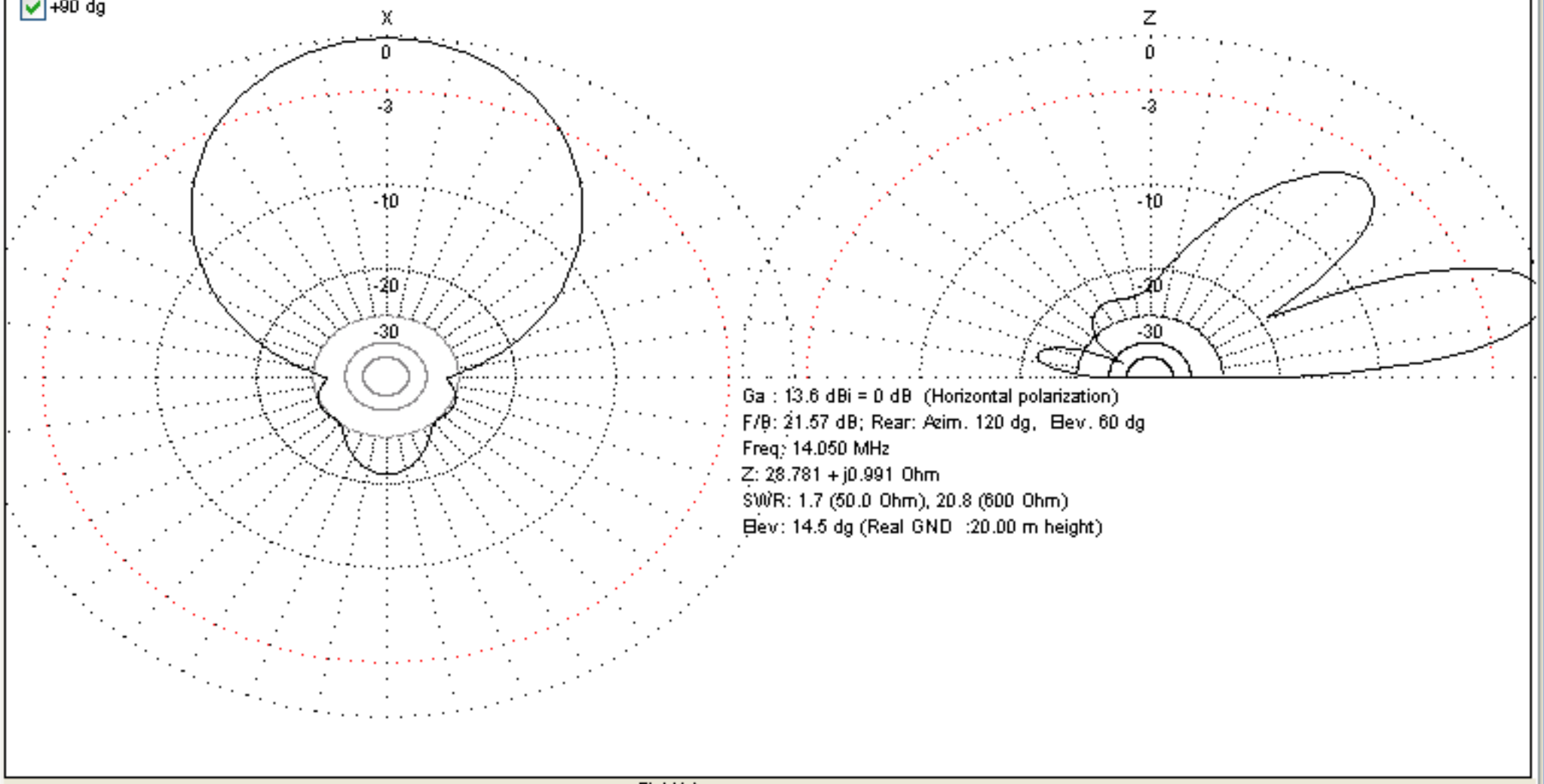

C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File Edit Service Tools Help
Geometry View Calculate Far field plots
diamo ora un'occhiata ai diagrammi di radiazione.
4ele 20m (30mm/25mm/20mm Pipe)
Freq 14.05 MHz
Ground
Free space
Perfect
Real
Ground setup
Add height 20.00 m
Material Al pipe
FILL MATRIX...
FACTOR MATRIX...
PULSE U (V) I (mA) Z (Ohm) SWR
w14c 1.00+j0.00 34.70-j1.20 28.78+j0.99 1.74
CURRENT DATA...
FAR FIELD ...
NO FATAL ERROR(S)
2.58 sec
No. F (MHz) R (Ohm) jX (Ohm) SWR 50 Gh dBd Ga dBi F/B dB Elev. Ground Add H. Polar.
1 14.05 28.781 0.991 1.74 --- 13.6 21.57 14.5 Real 20.0 hori.
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit

C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

+90 dg

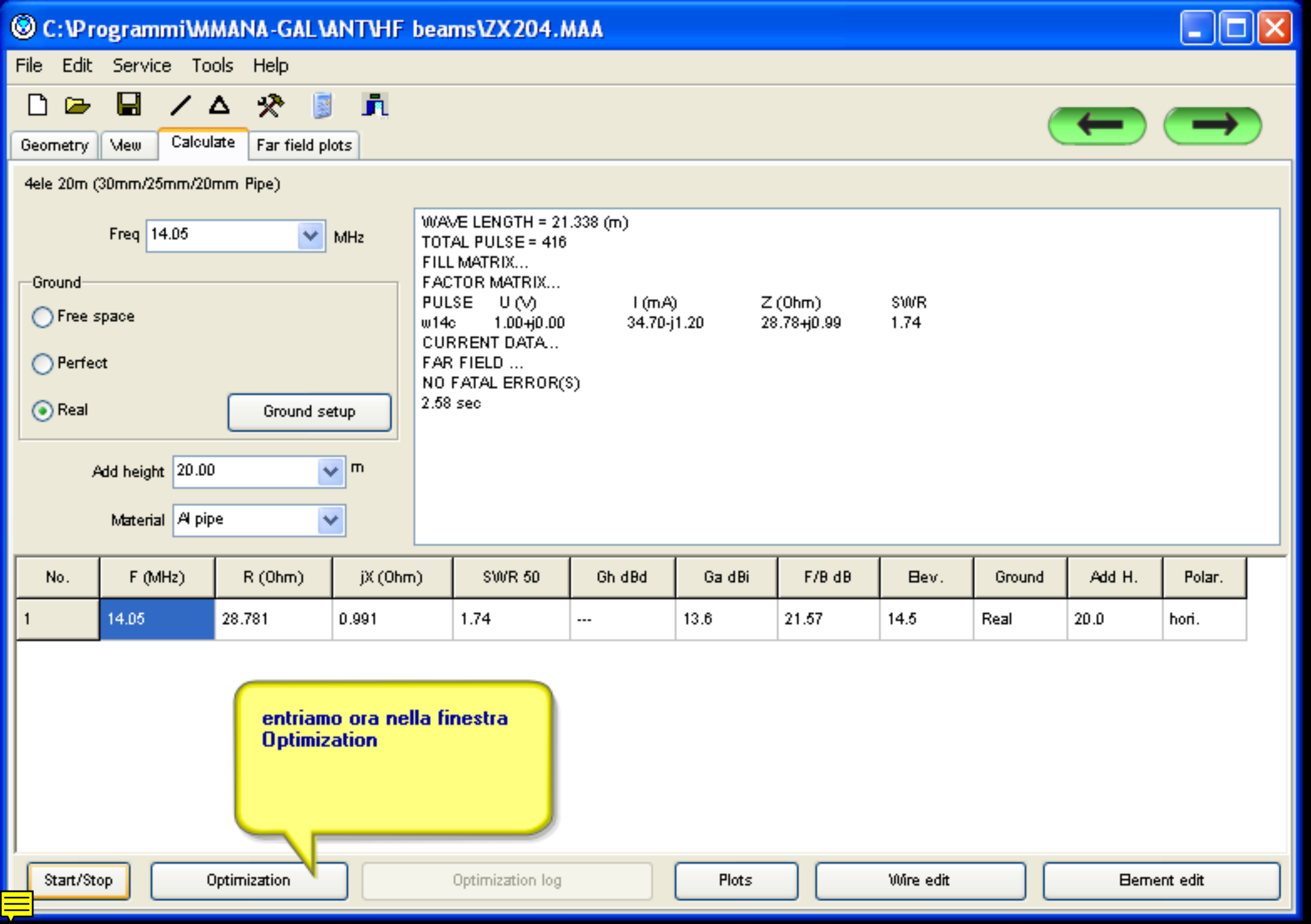


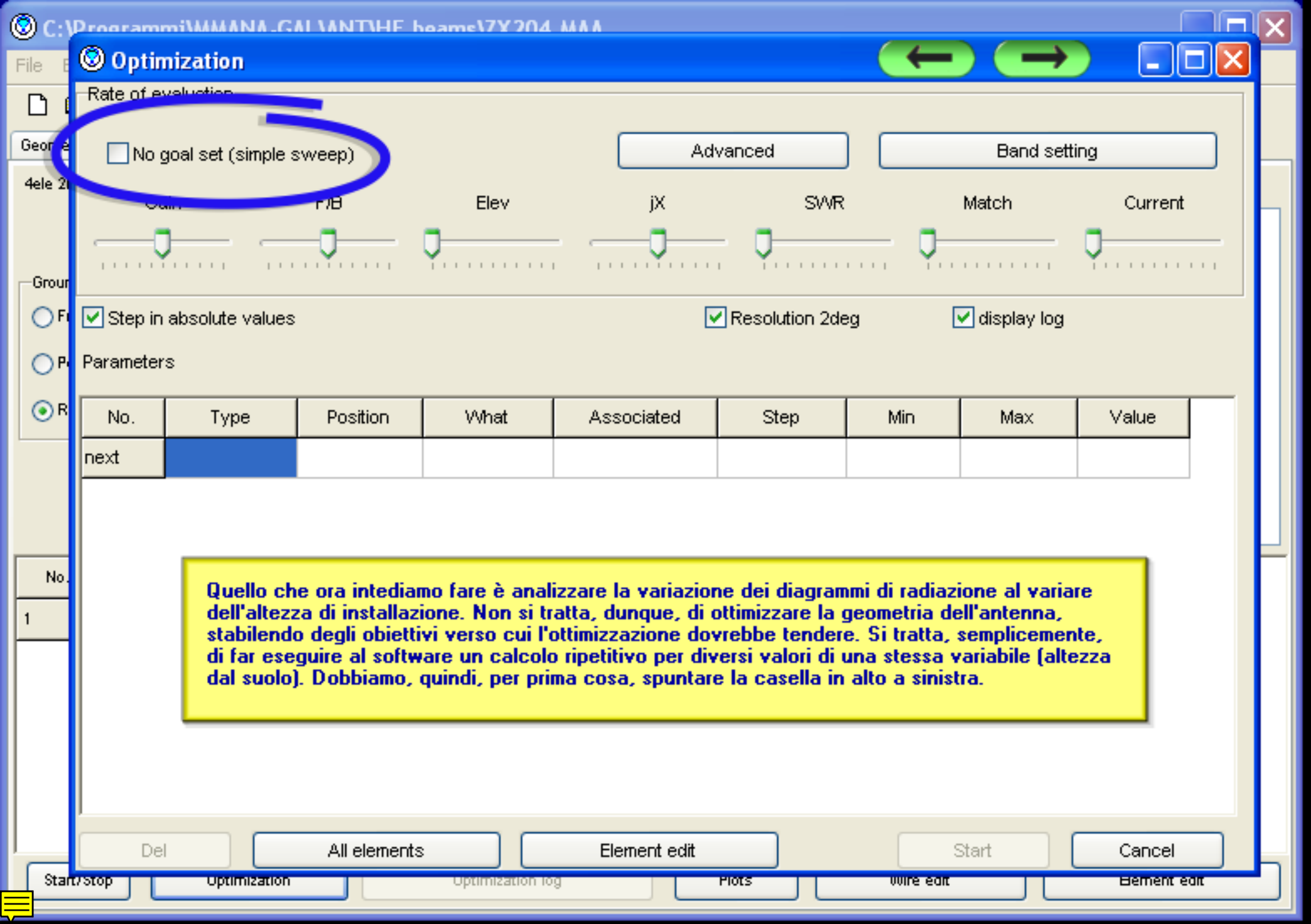
Ga : 13.6 dBi = 0 dB (Horizontal polarization)
F/B: 21.57 dB; Rear: Azim. 120 dg, Elev. 60 dg
Freq: 14.050 MHz
Z: 28.781 + j0.991 Ohm
SWR: 1.7 (50.0 Ohm), 20.8 (600 Ohm)
Elev: 14.5 dg (Real GND :20.00 m height)

Elevation | 3D FF

Field(s): V | H | Total | V+H

Print


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File Edit Service Tools Help
Geometry View Calculate Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
Freq 14.05 MHz
Ground
Free space
Perfect
Real
Ground setup
Add height 20.00 m
Material Al pipe
WAVE LENGTH = 21.338 (m)
TOTAL PULSE = 416
FILL MATRIX...
FACTOR MATRIX...
PULSE U (V) I (mA) Z (Ohm) SWR
w14c 1.00+j0.00 34.70-j1.20 28.78+j0.99 1.74
CURRENT DATA...
FAR FIELD ...
NO FATAL ERROR(S)
2.58 sec
No. F (MHz) R (Ohm) jX (Ohm) SWR 50 Gh dBd Ga dBi F/B dB Elev. Ground Add H. Polar.
1 14.05 28.781 0.991 1.74 --- 13.6 21.57 14.5 Real 20.0 hori.
entriamo ora nella finestra Optimization
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
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jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
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What
Associated
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Value
next
Quello che ora intediamo fare è analizzare la variazione dei diagrammi di radiazione al variare dell'altezza di installazione. Non si tratta, dunque, di ottimizzare la geometria dell'antenna, stabilendo degli obiettivi verso cui l'ottimizzazione dovrebbe tendere. Si tratta, semplicemente, di far eseguire al software un calcolo ripetitivo per diversi valori di una stessa variabile (altezza dal suolo). Dobbiamo, quindi, per prima cosa, spuntare la casella in alto a sinistra.
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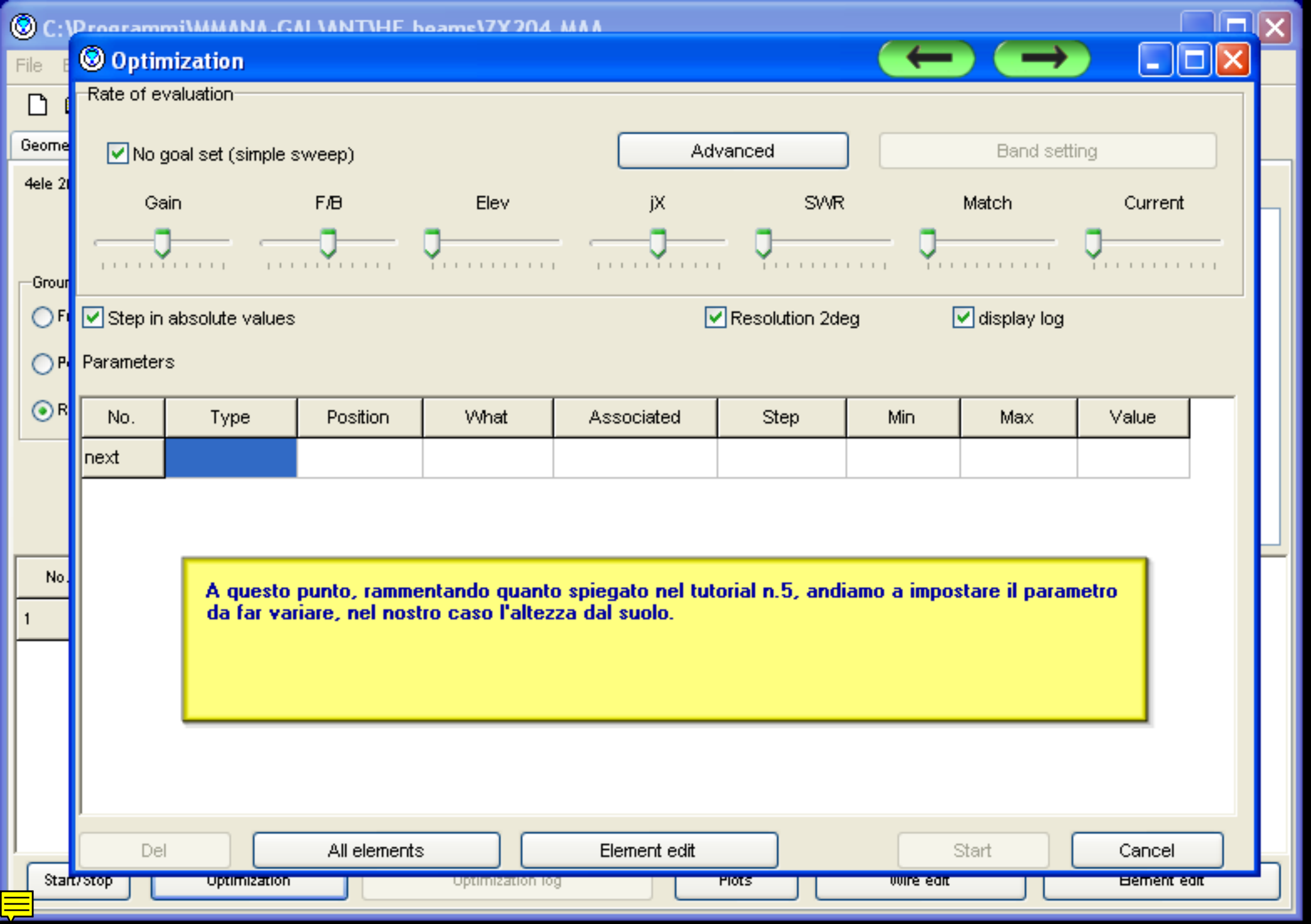
Start/Stop
Optimization
Plots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A questo punto, rammentando quanto spiegato nel tutorial n.5, andiamo a impostare il parametro da far variare, nel nostro caso l'altezza dal suolo.
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Optimization log
Plots
Wire edit
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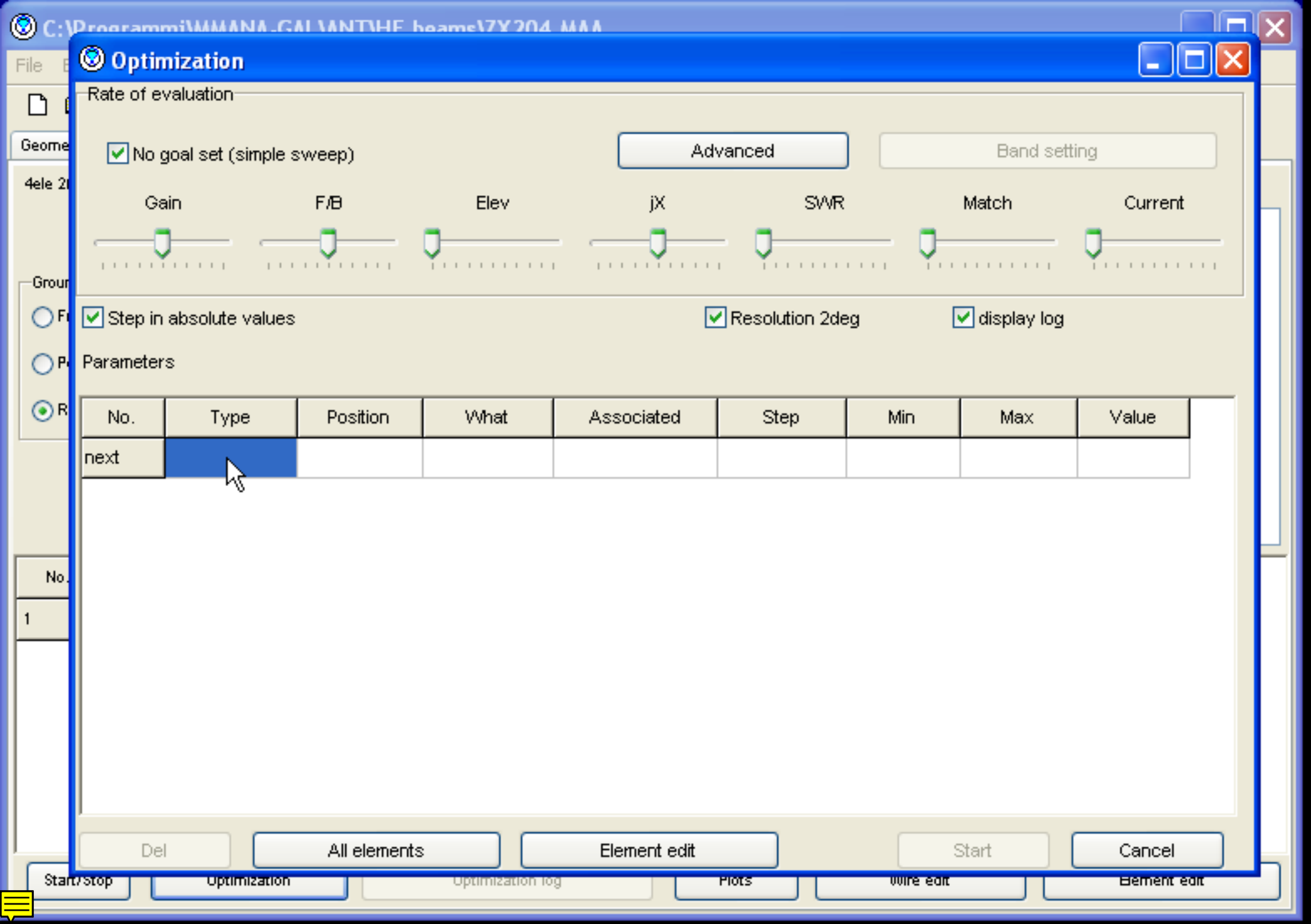
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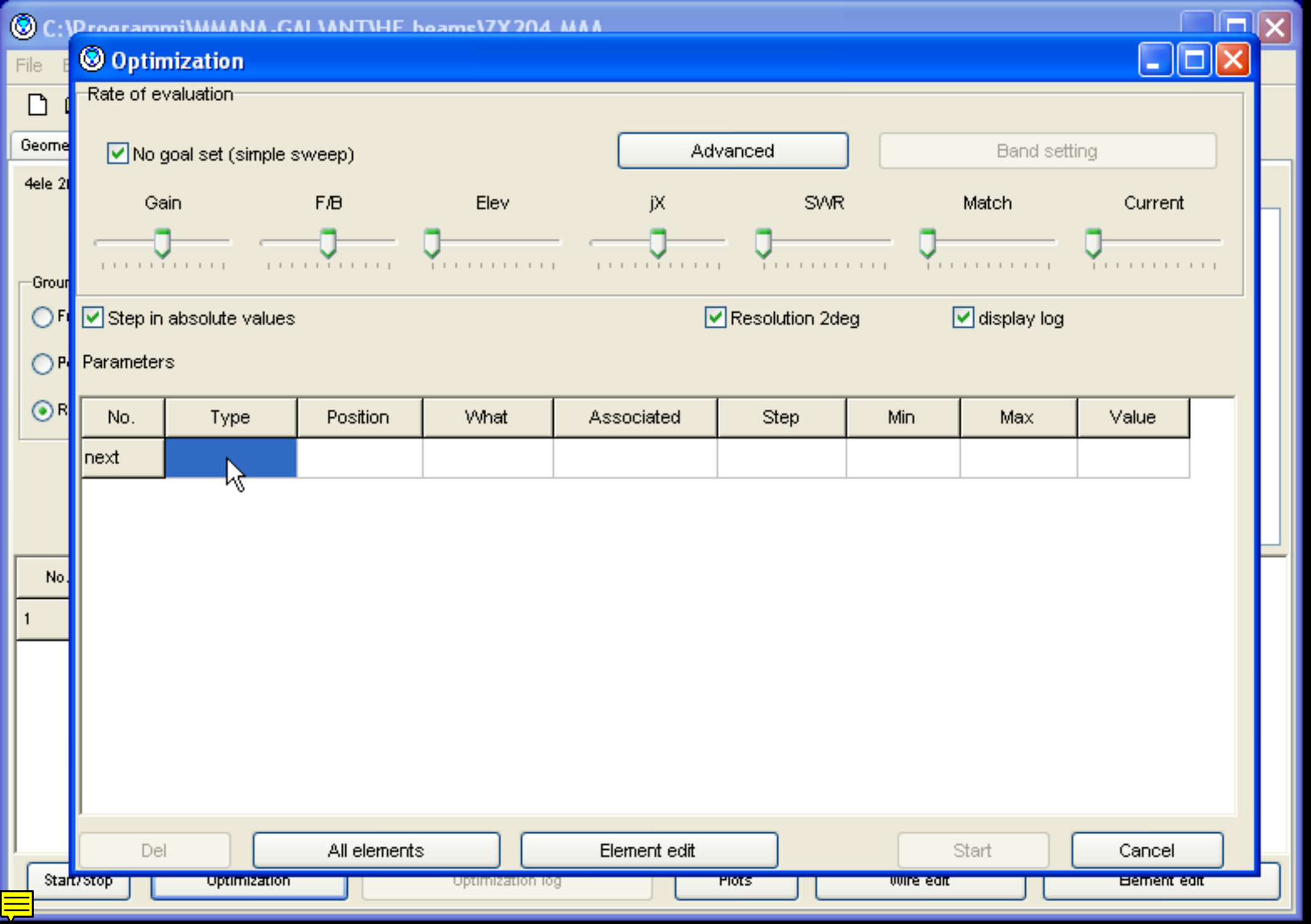
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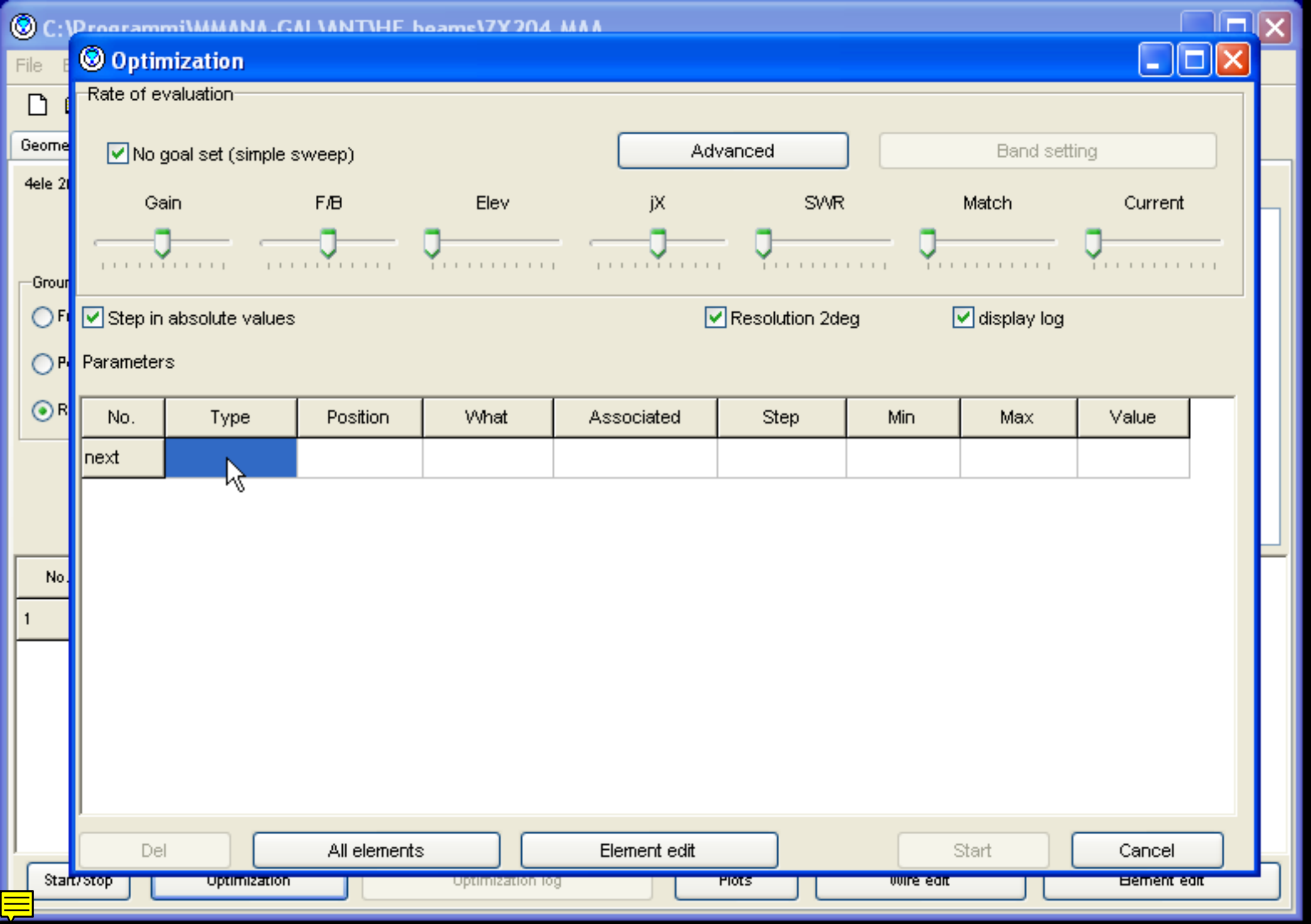
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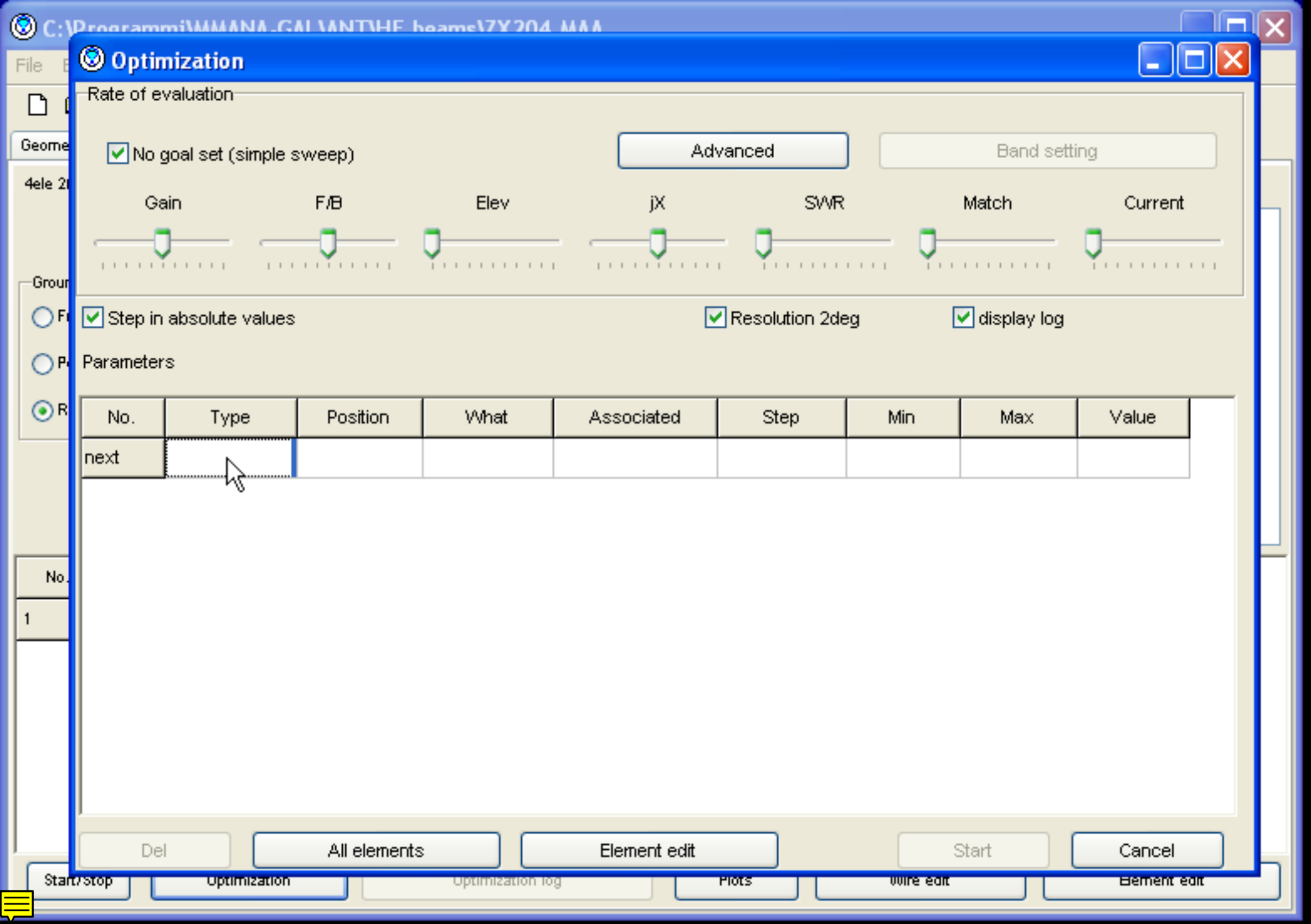
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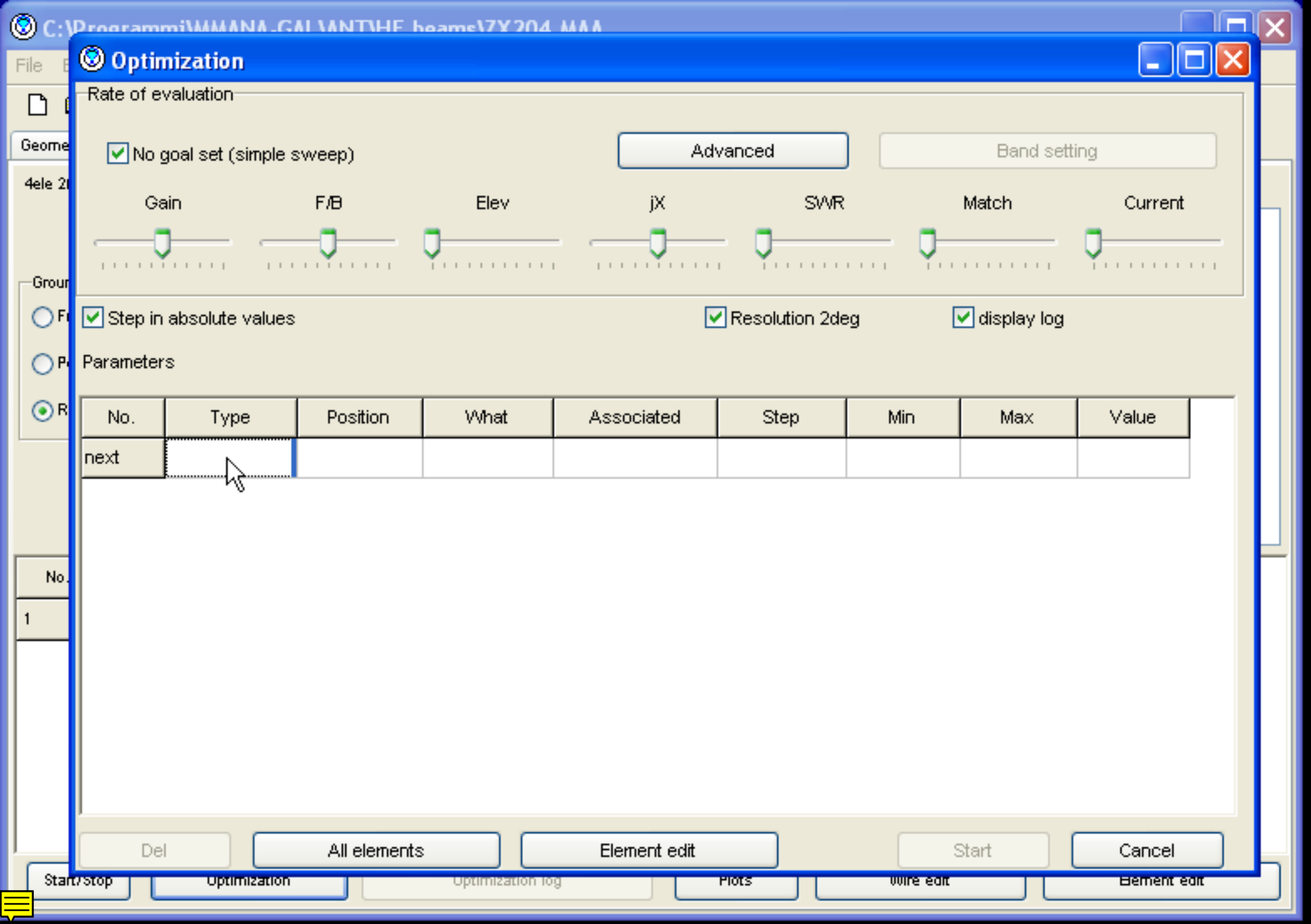
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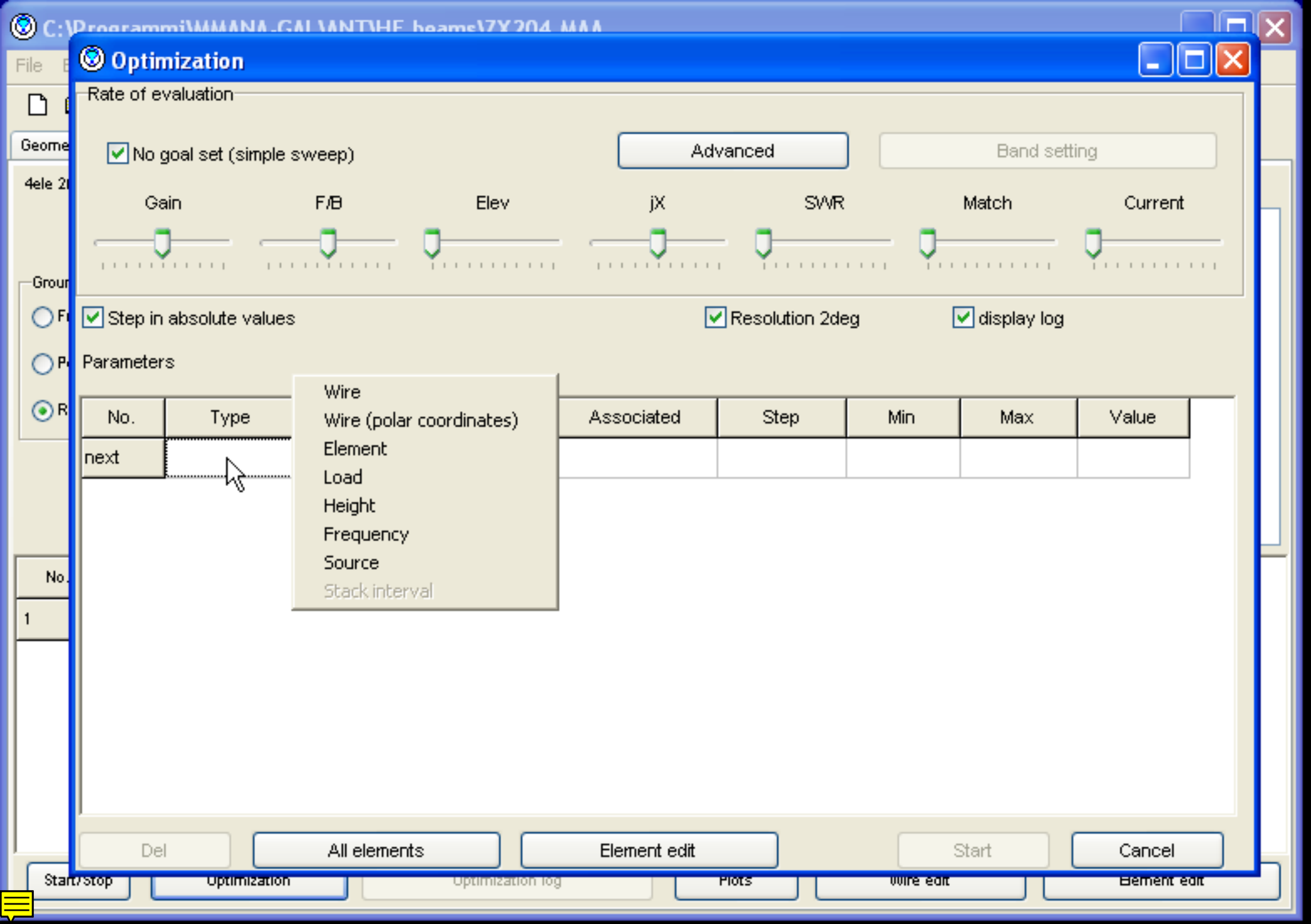
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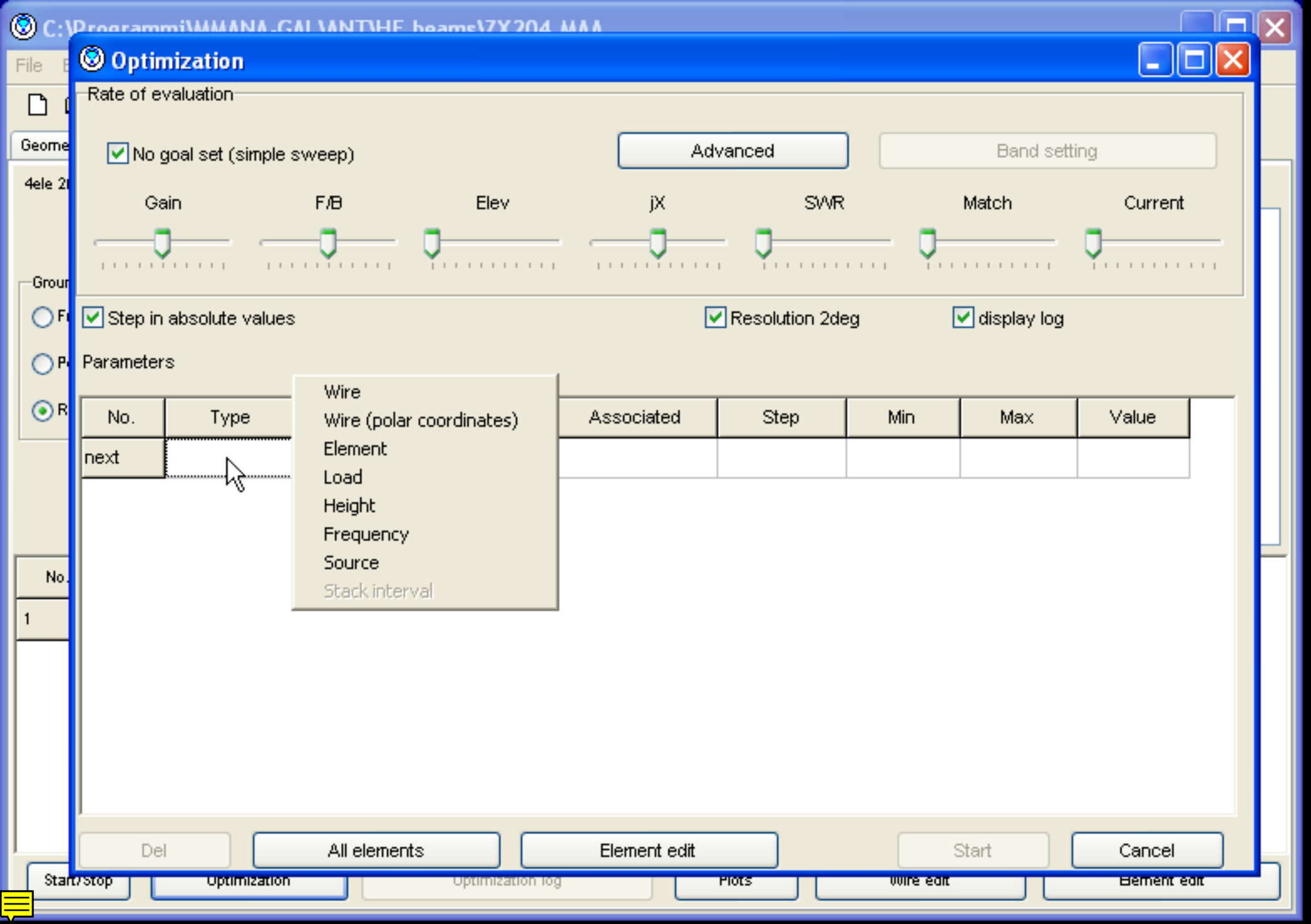
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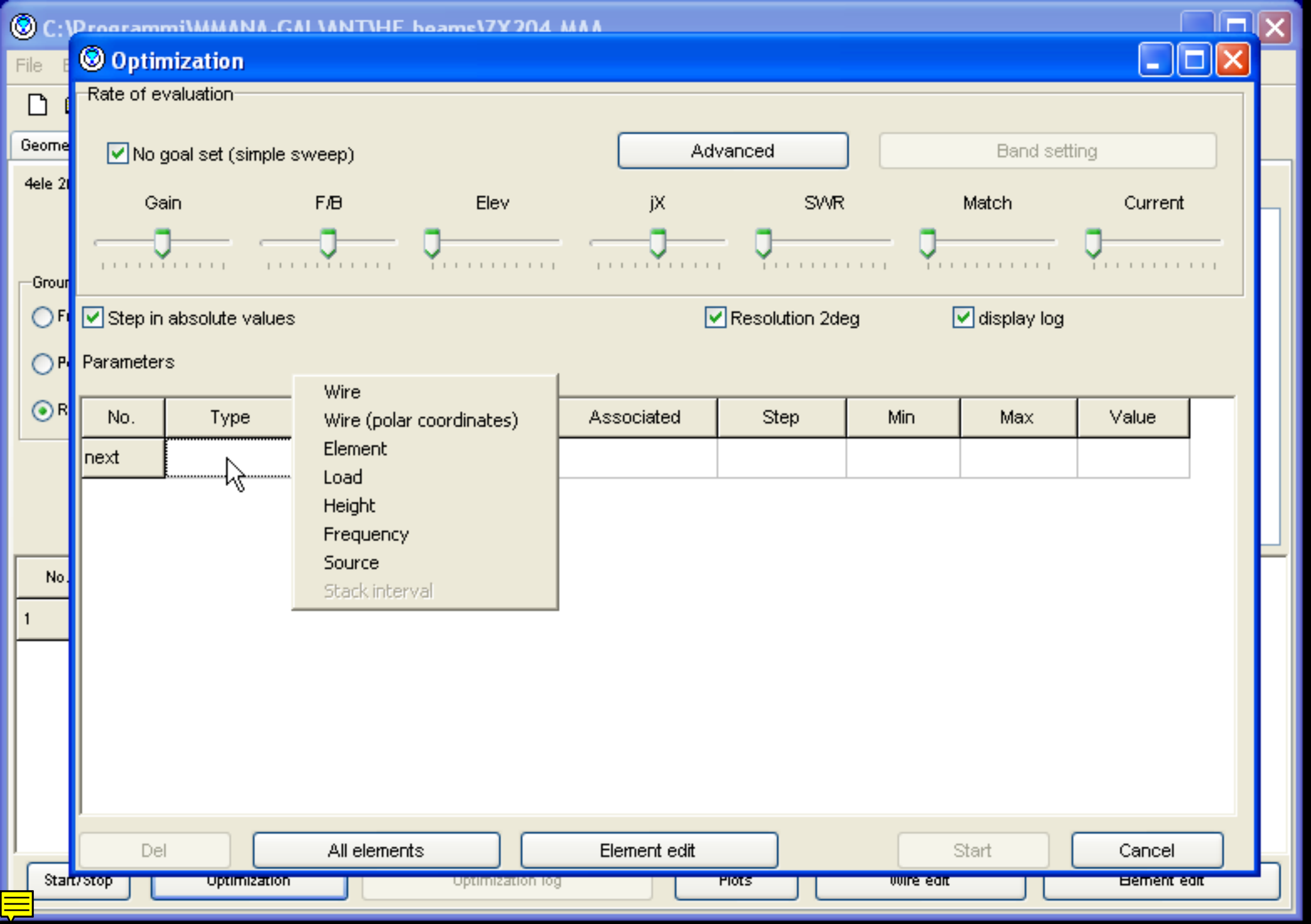
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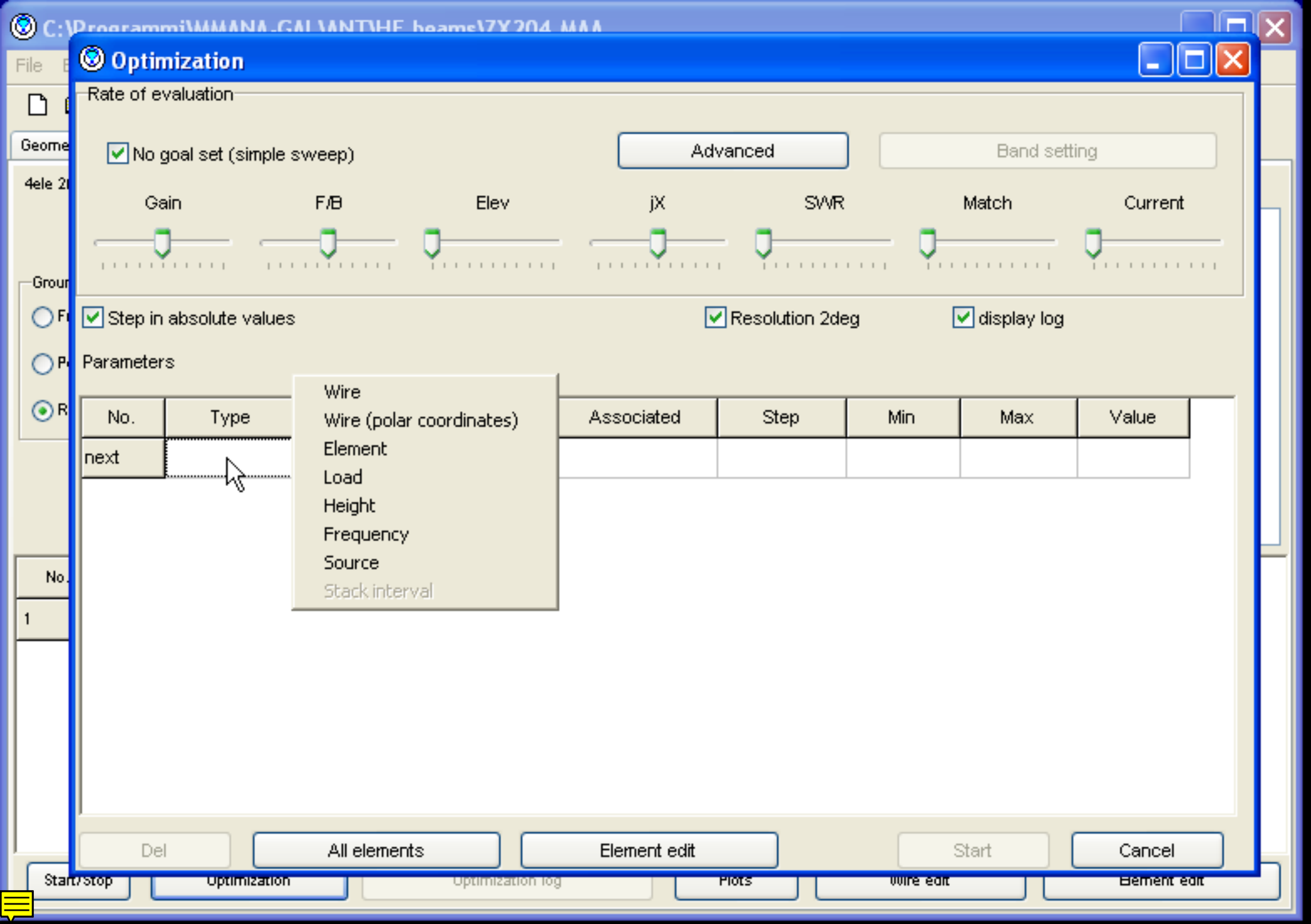
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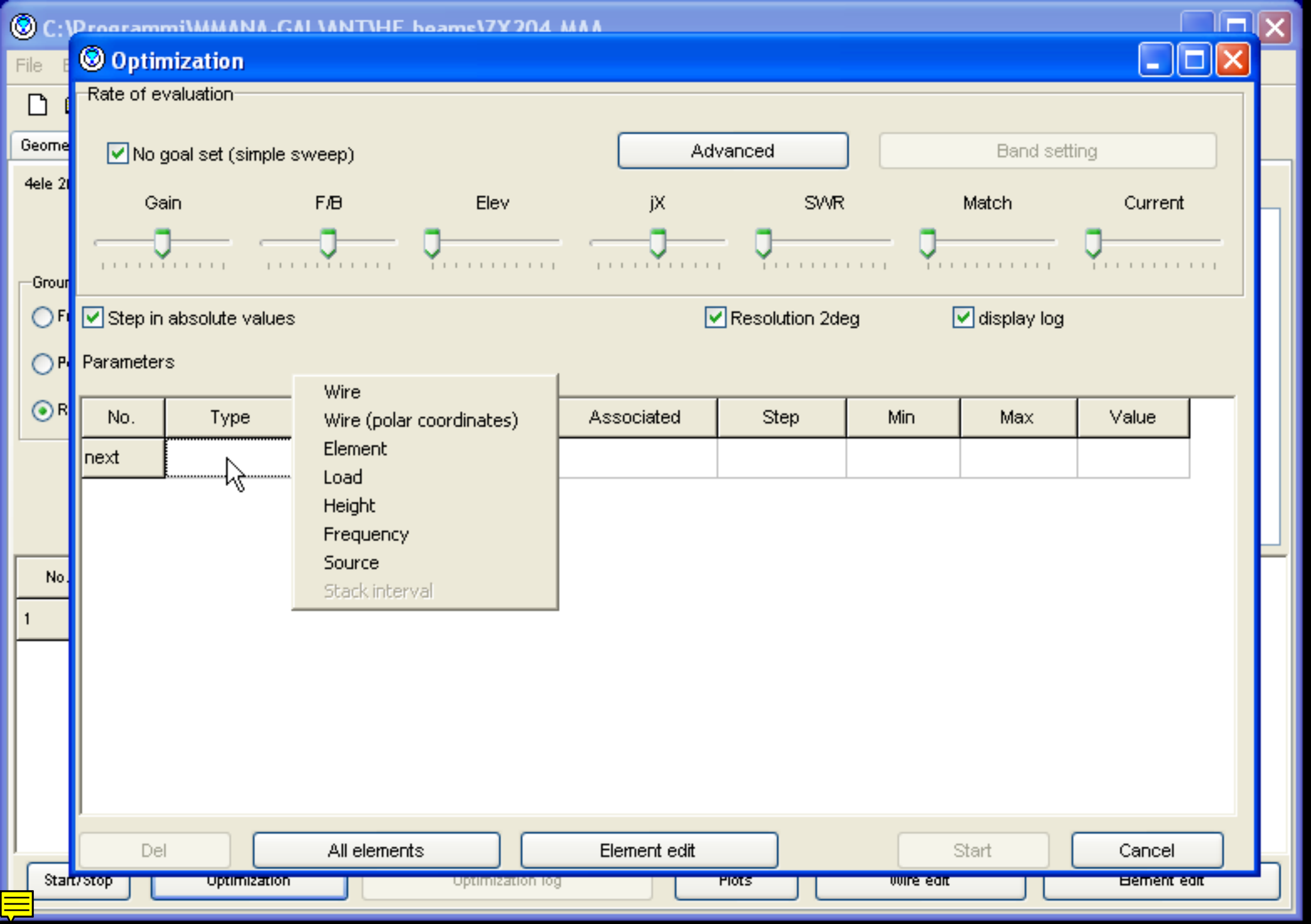
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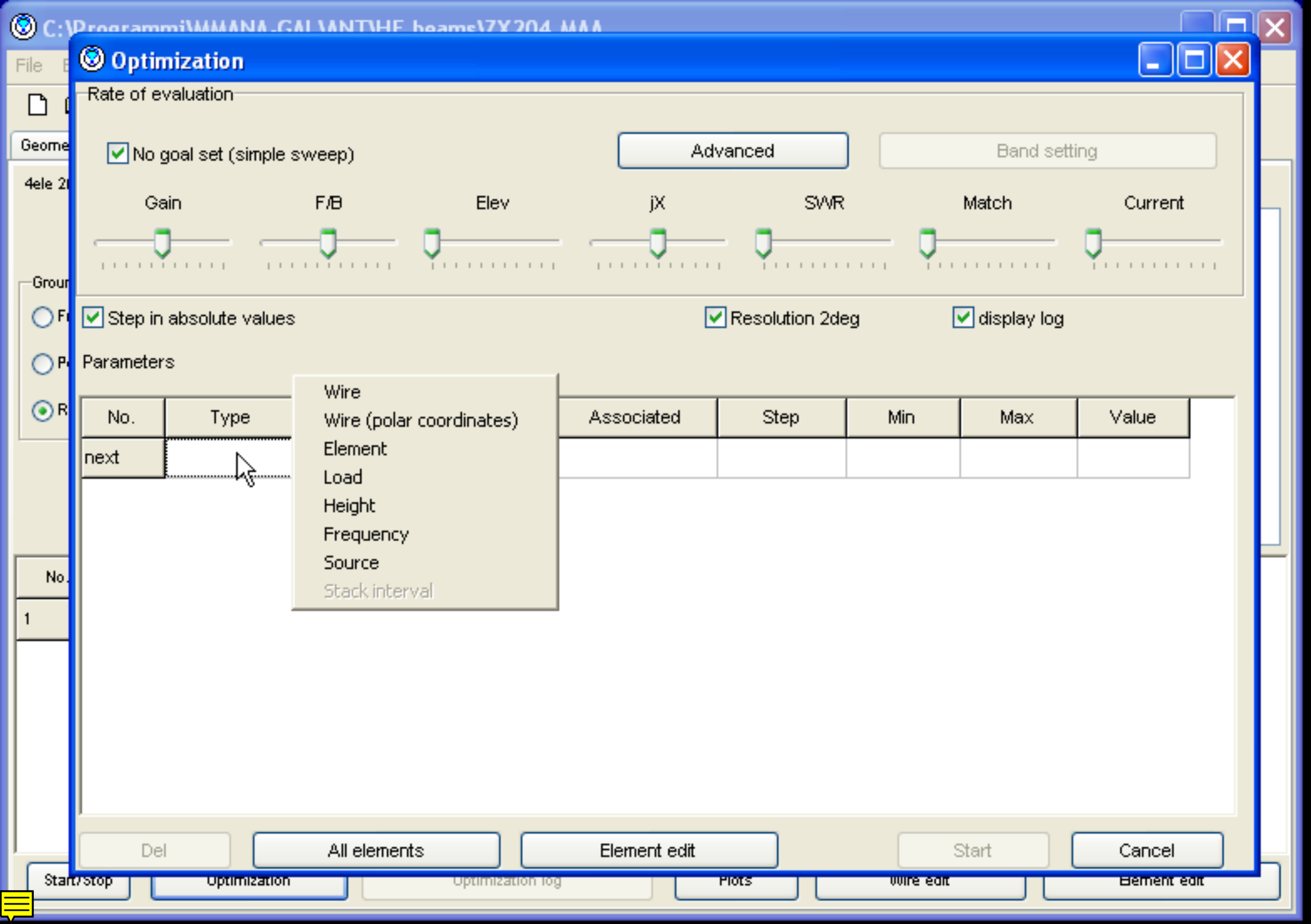
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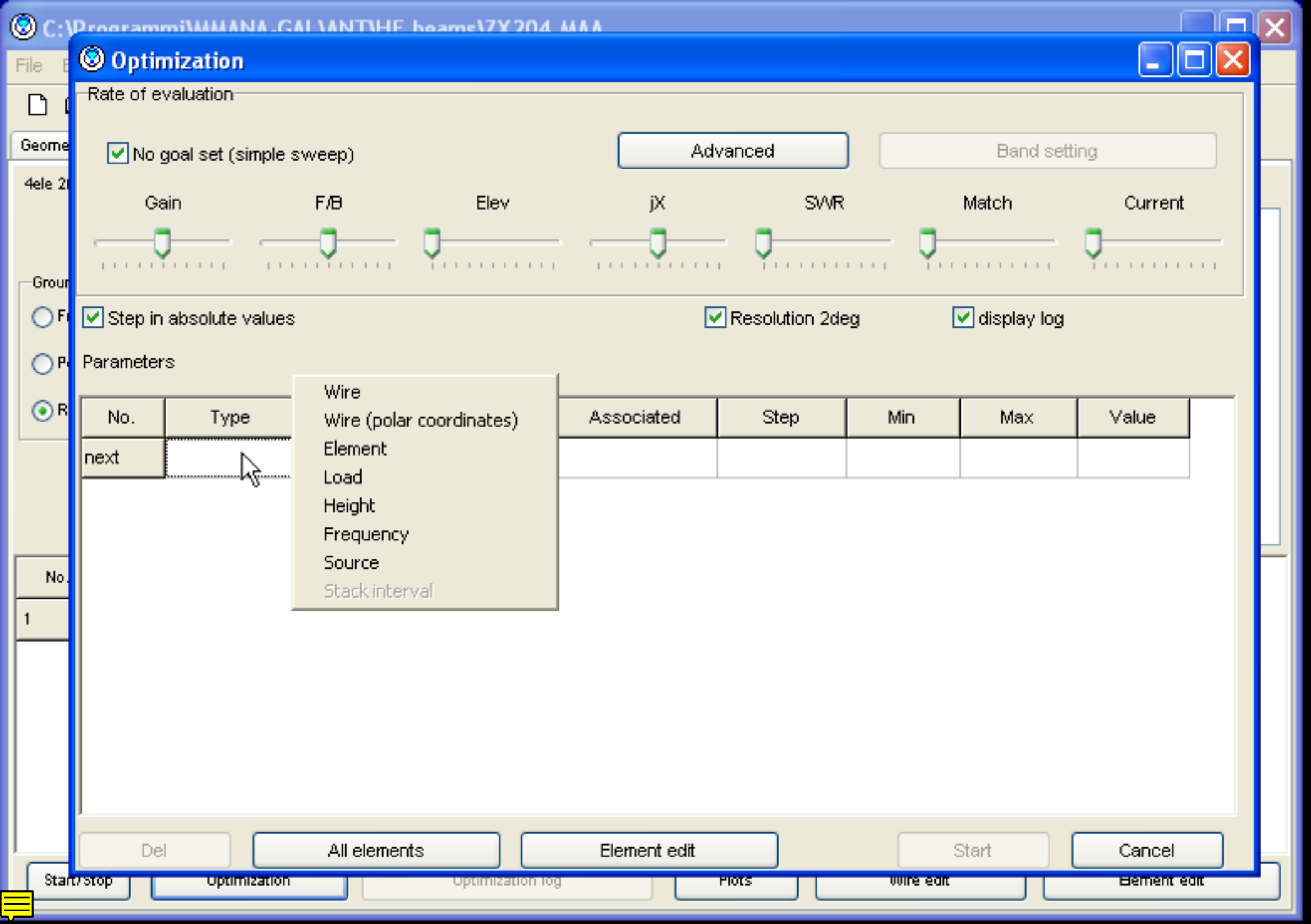
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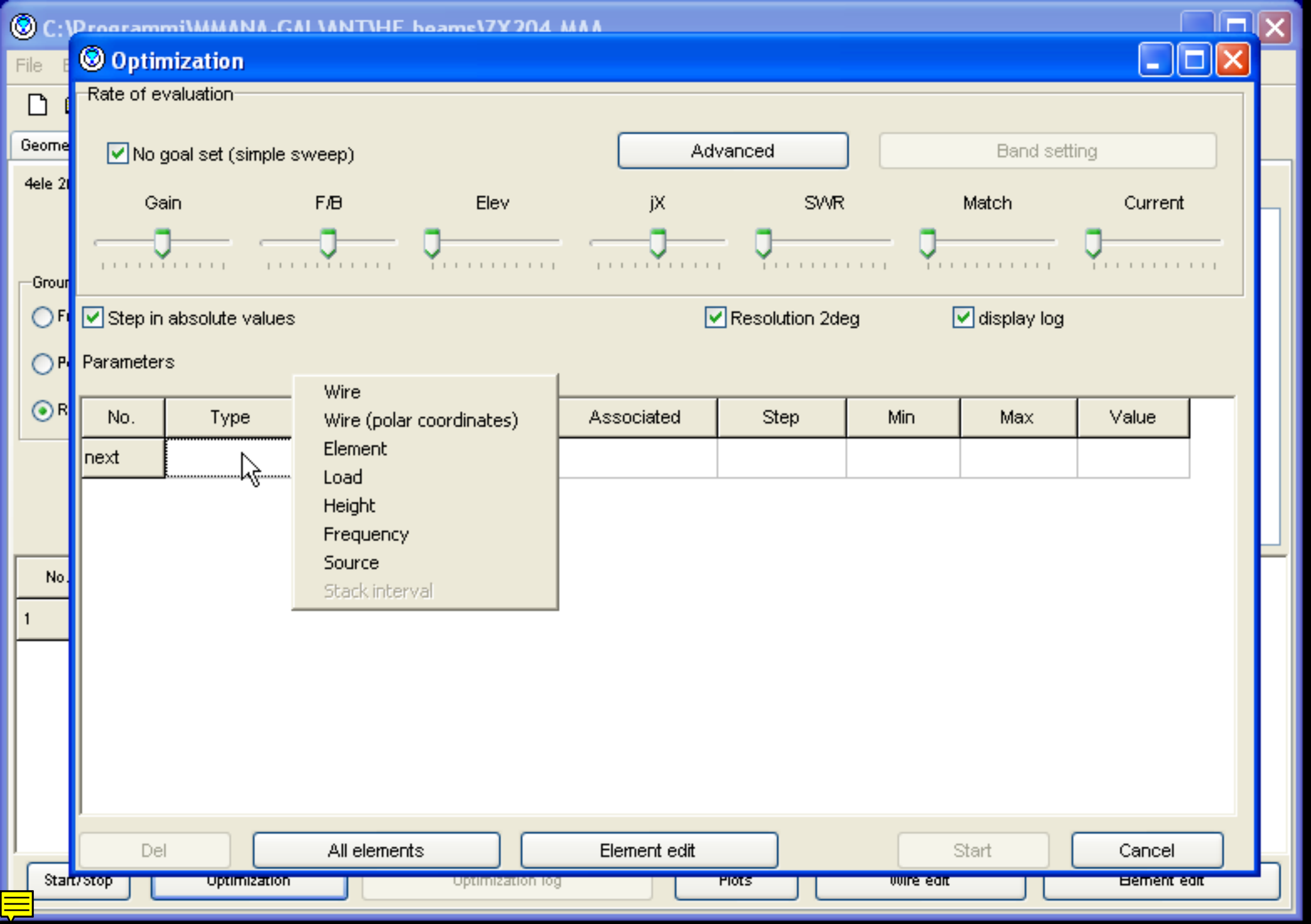
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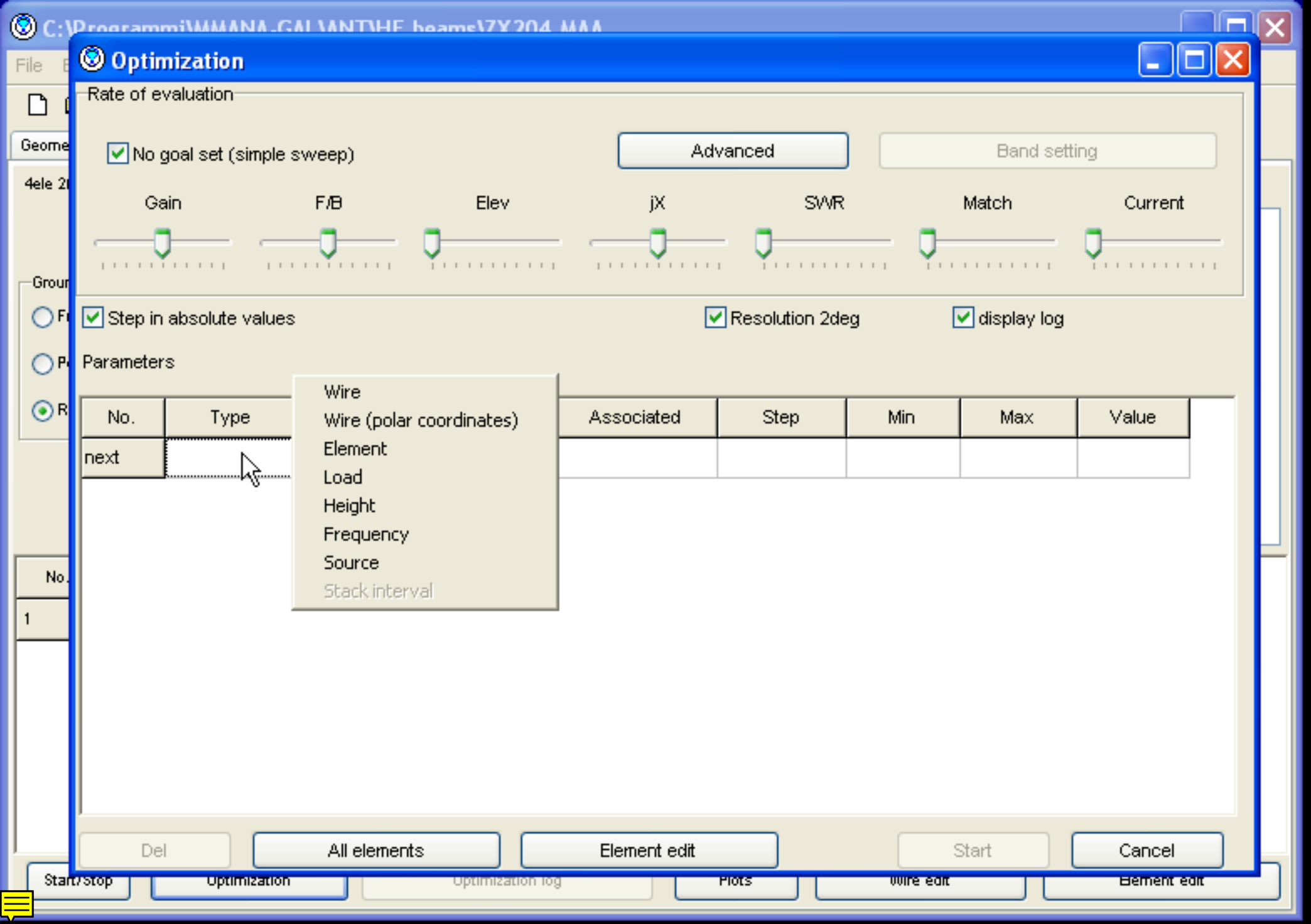
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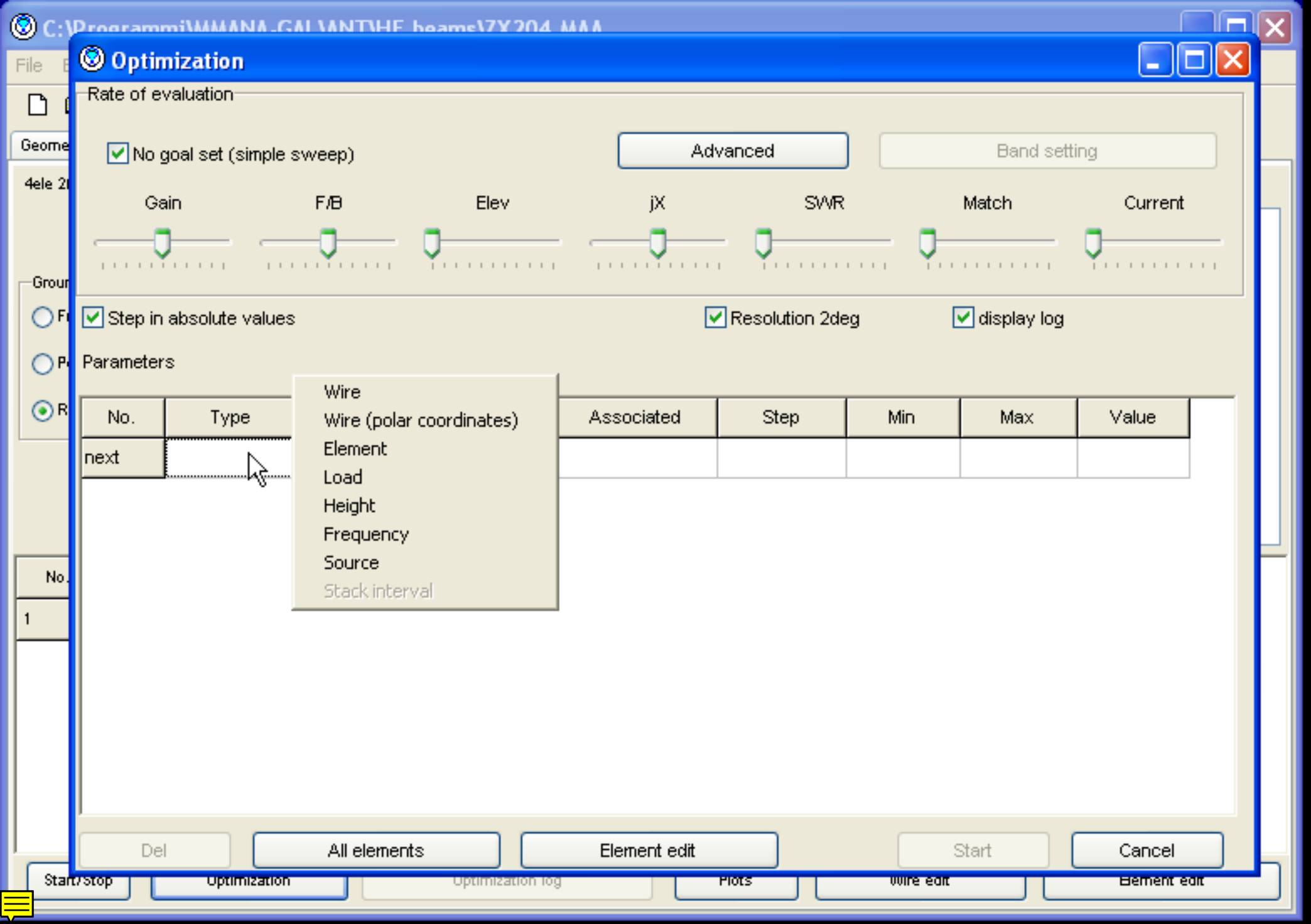
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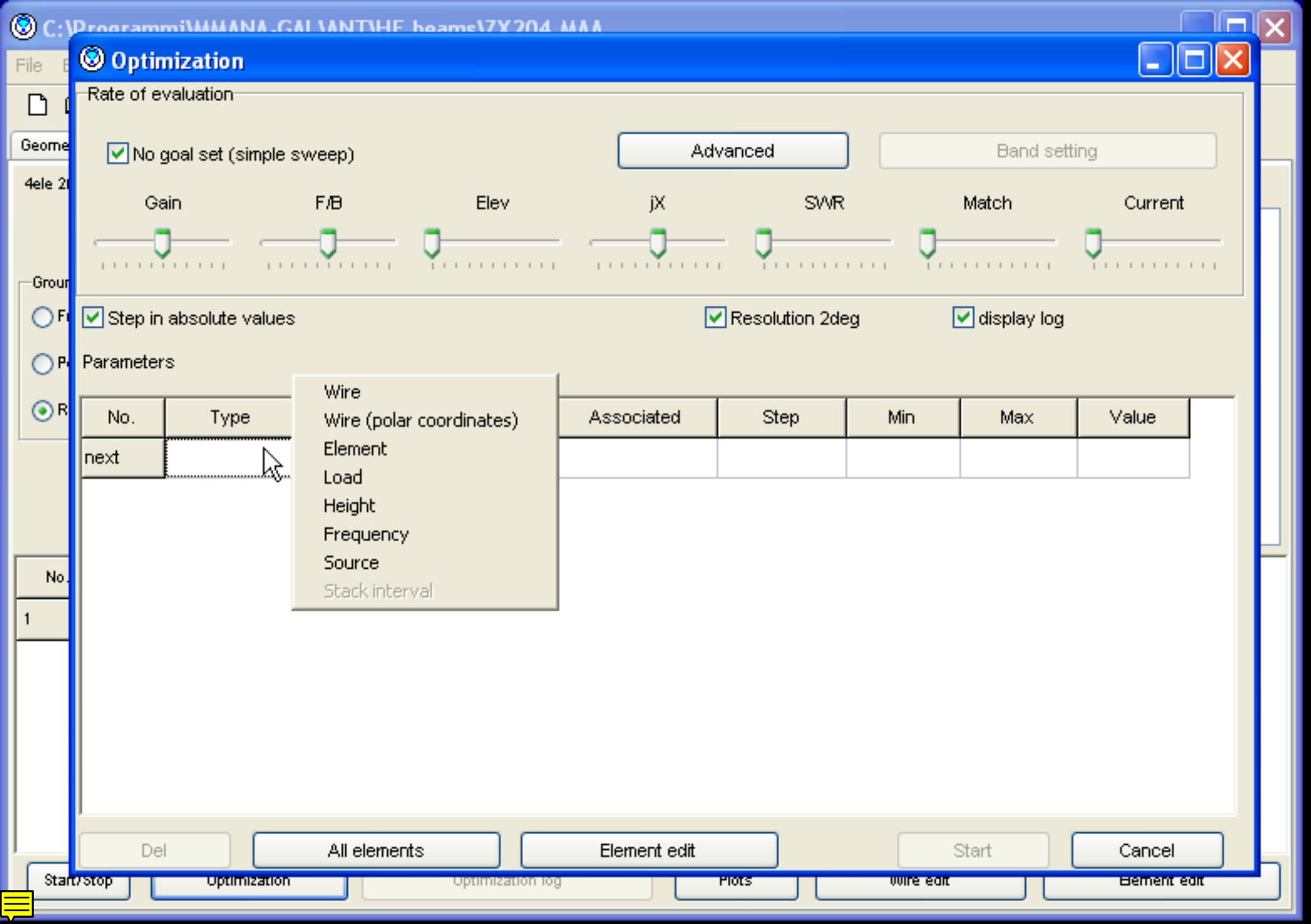
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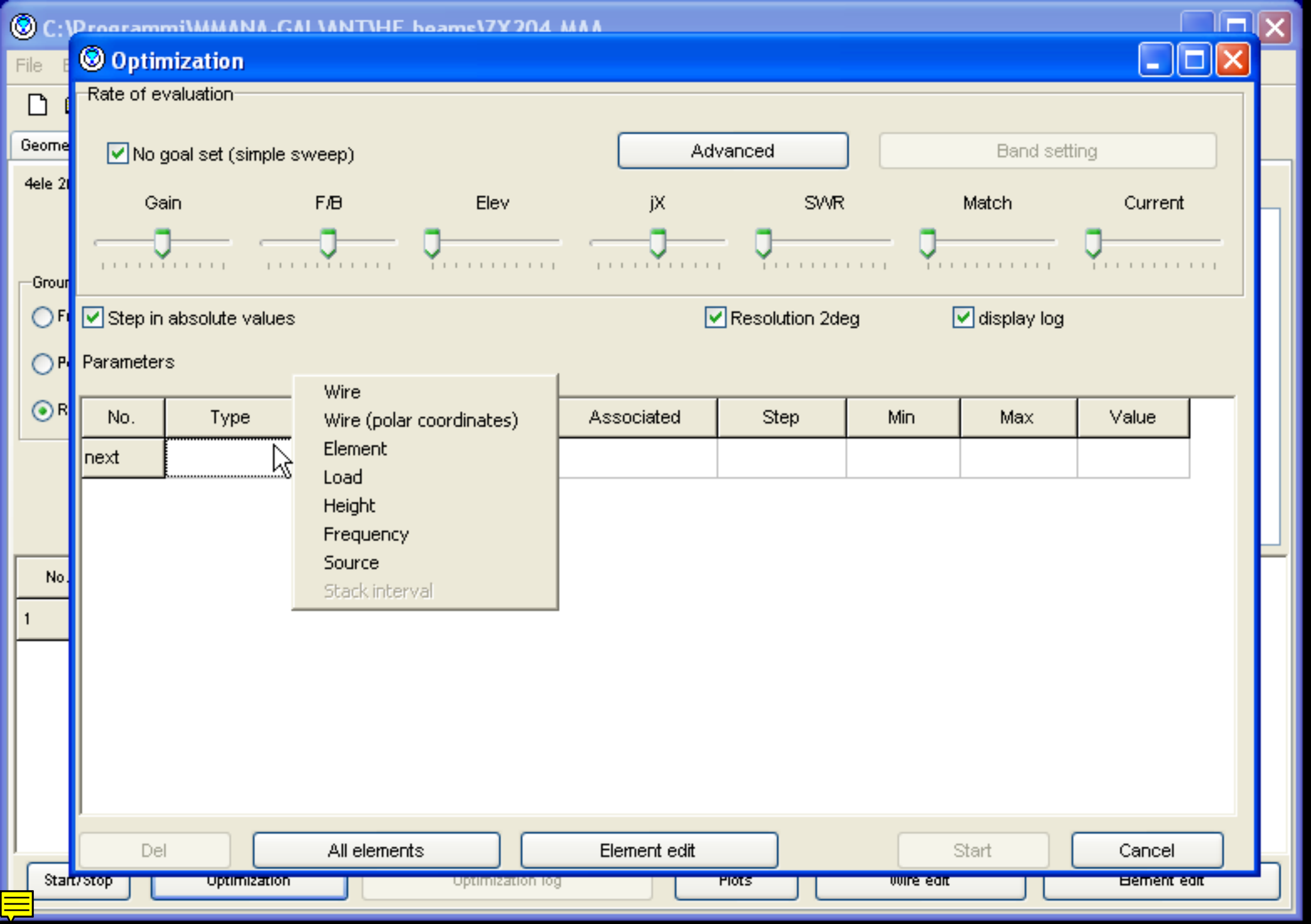
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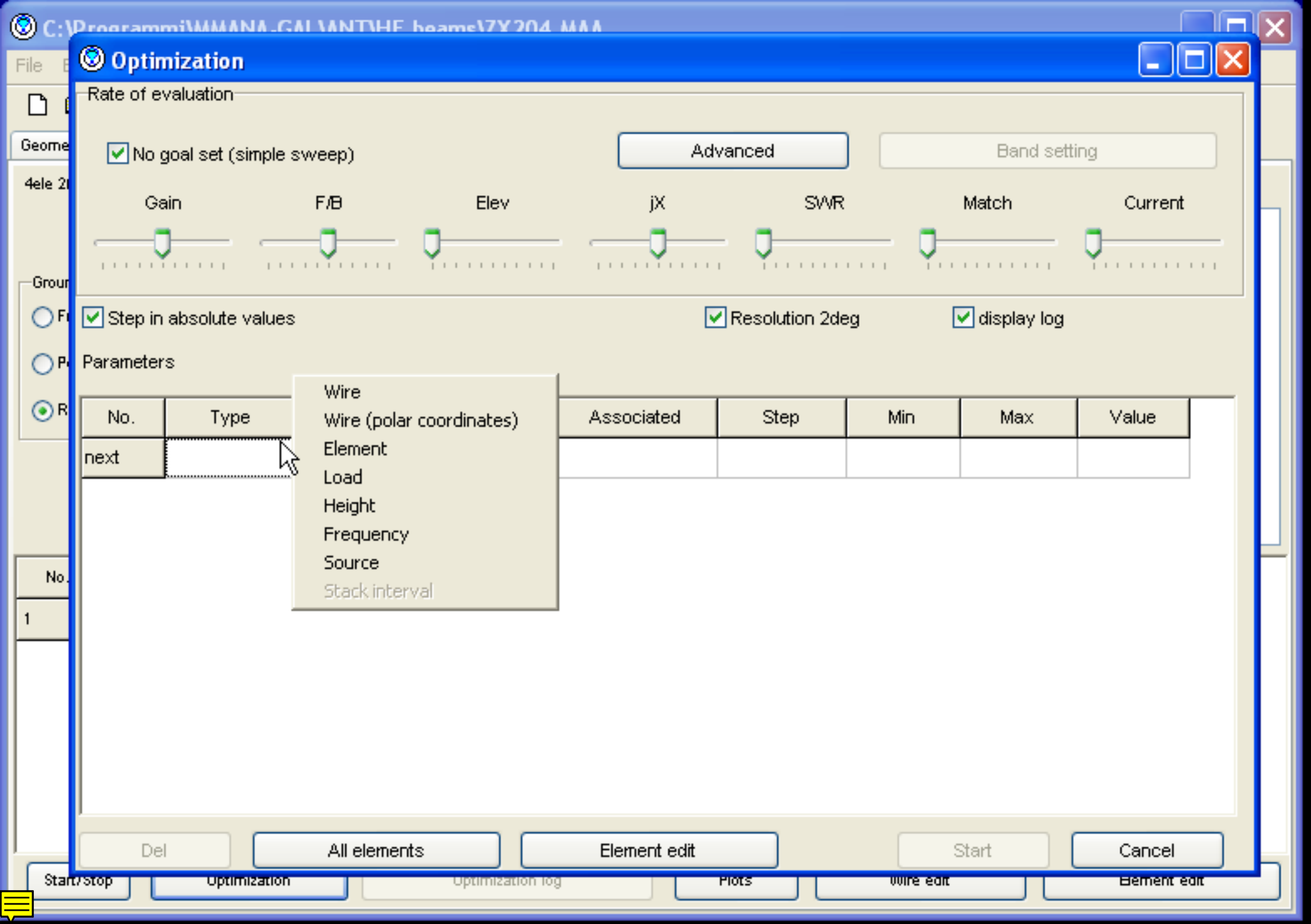
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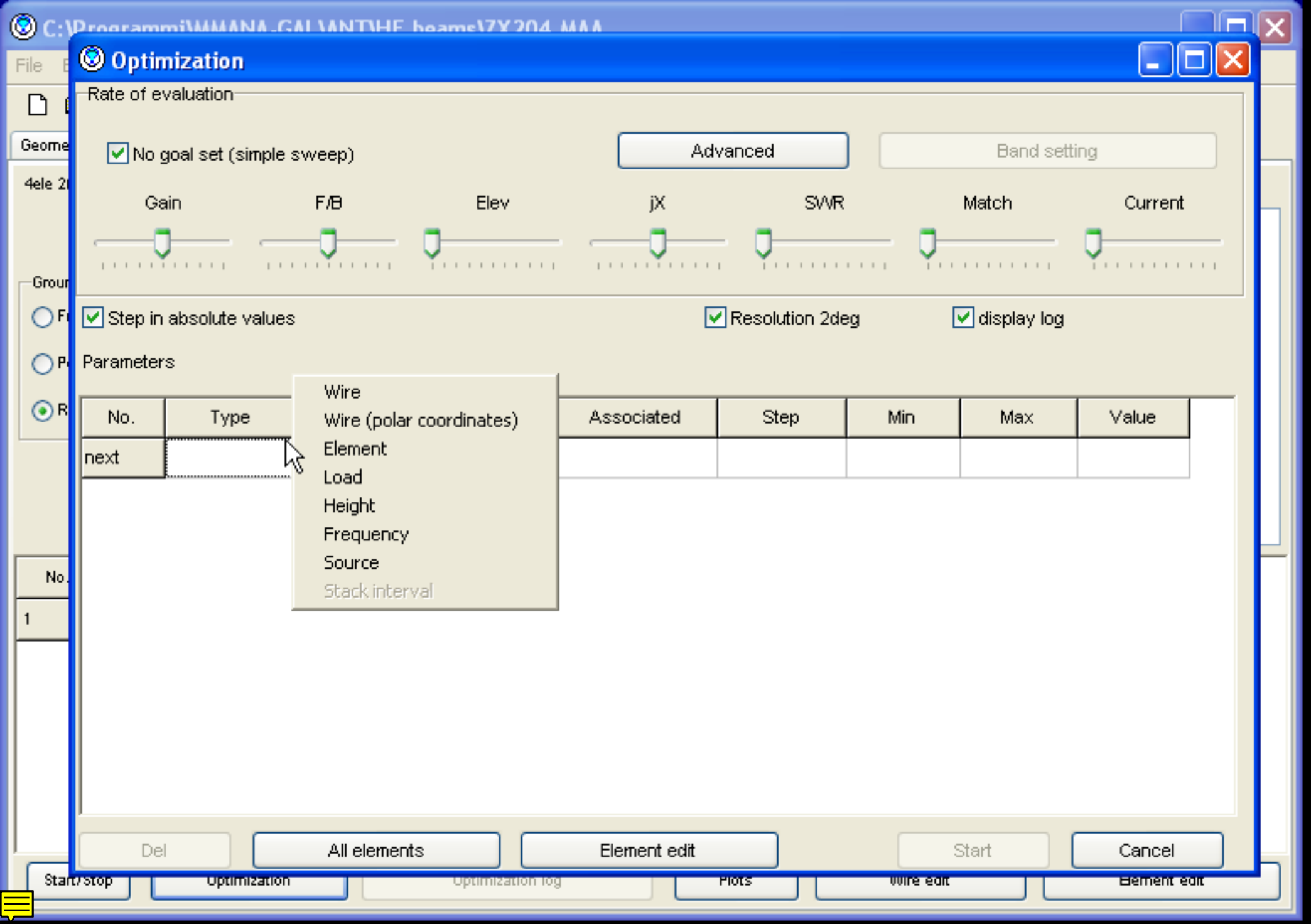
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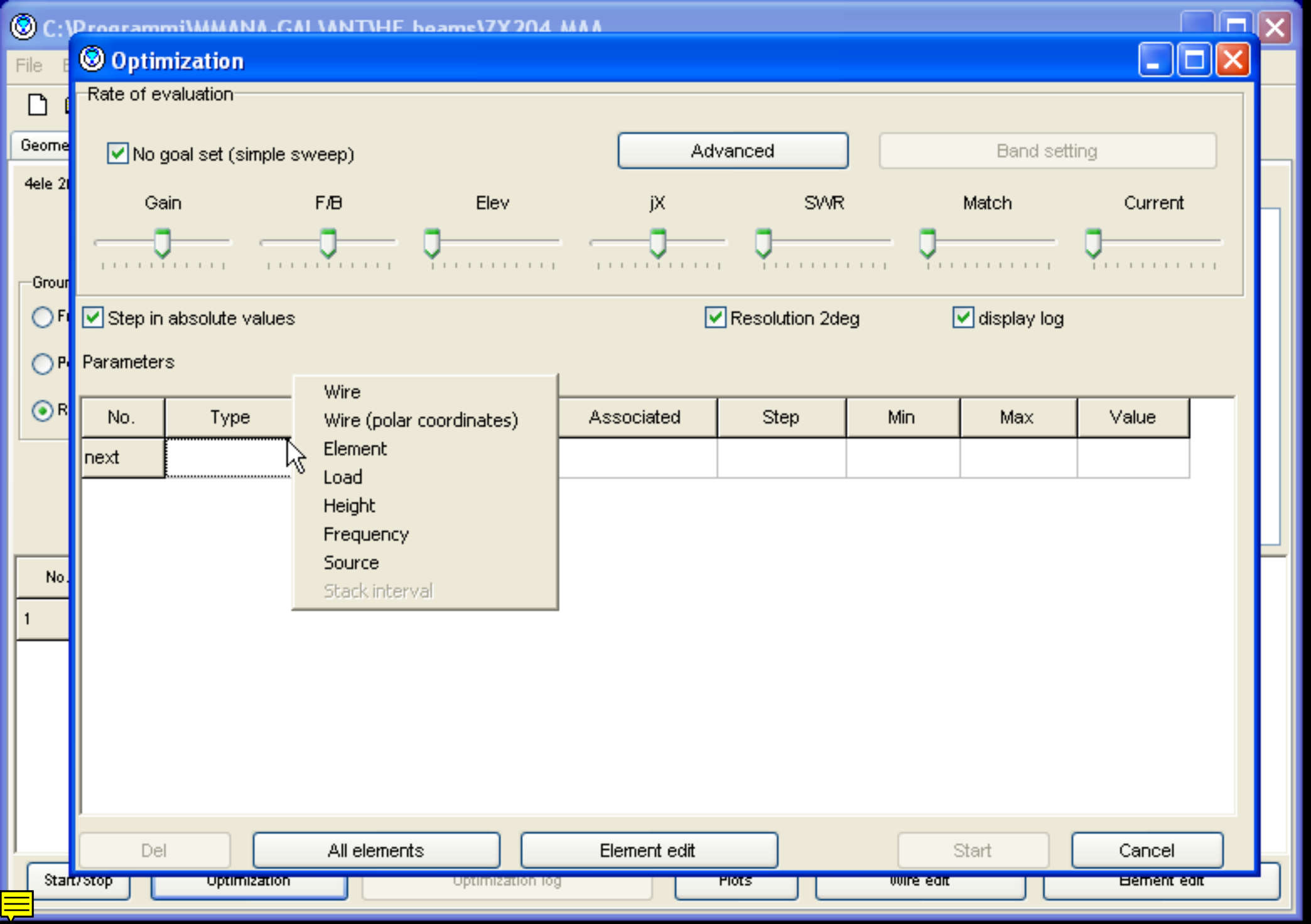
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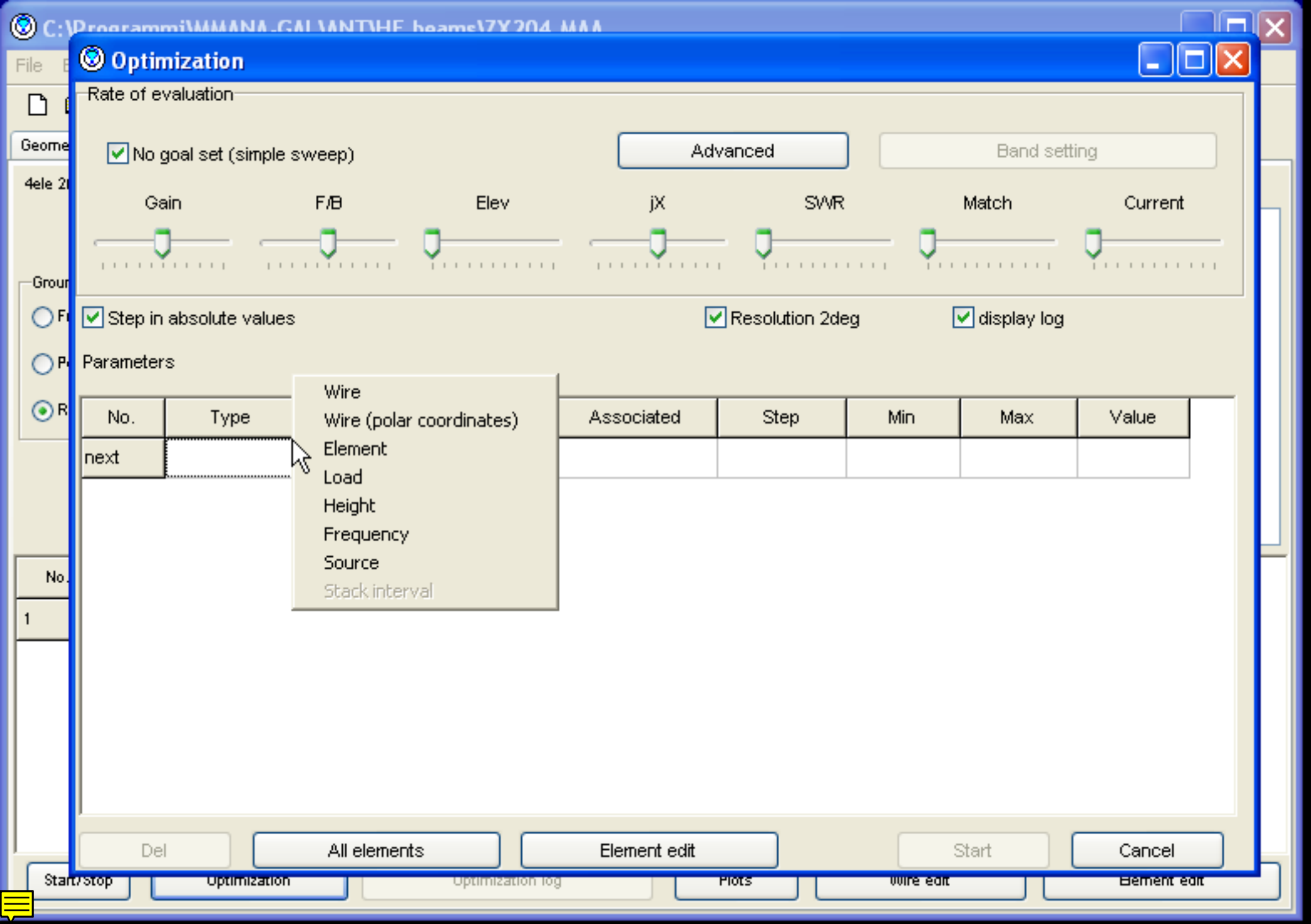
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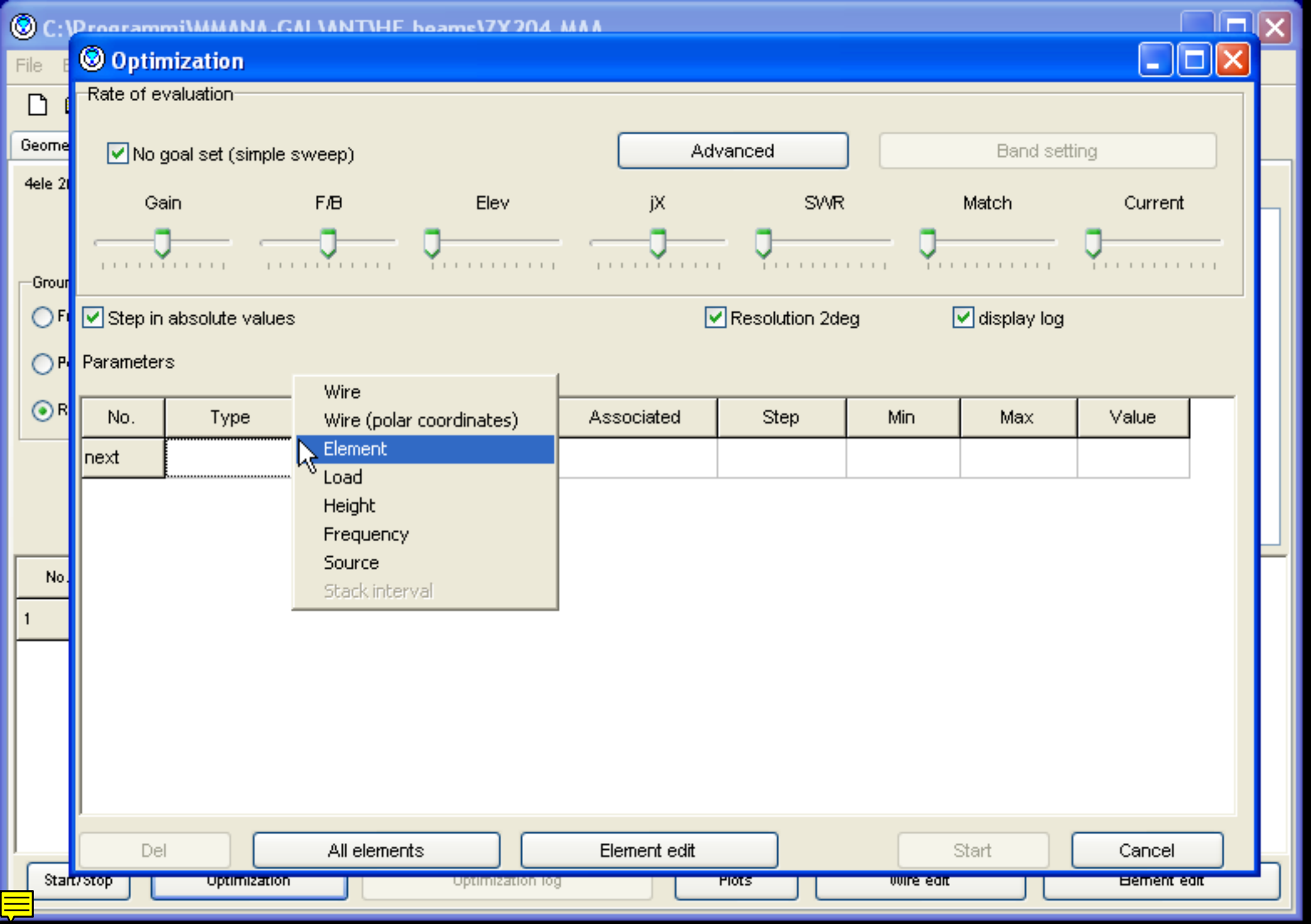
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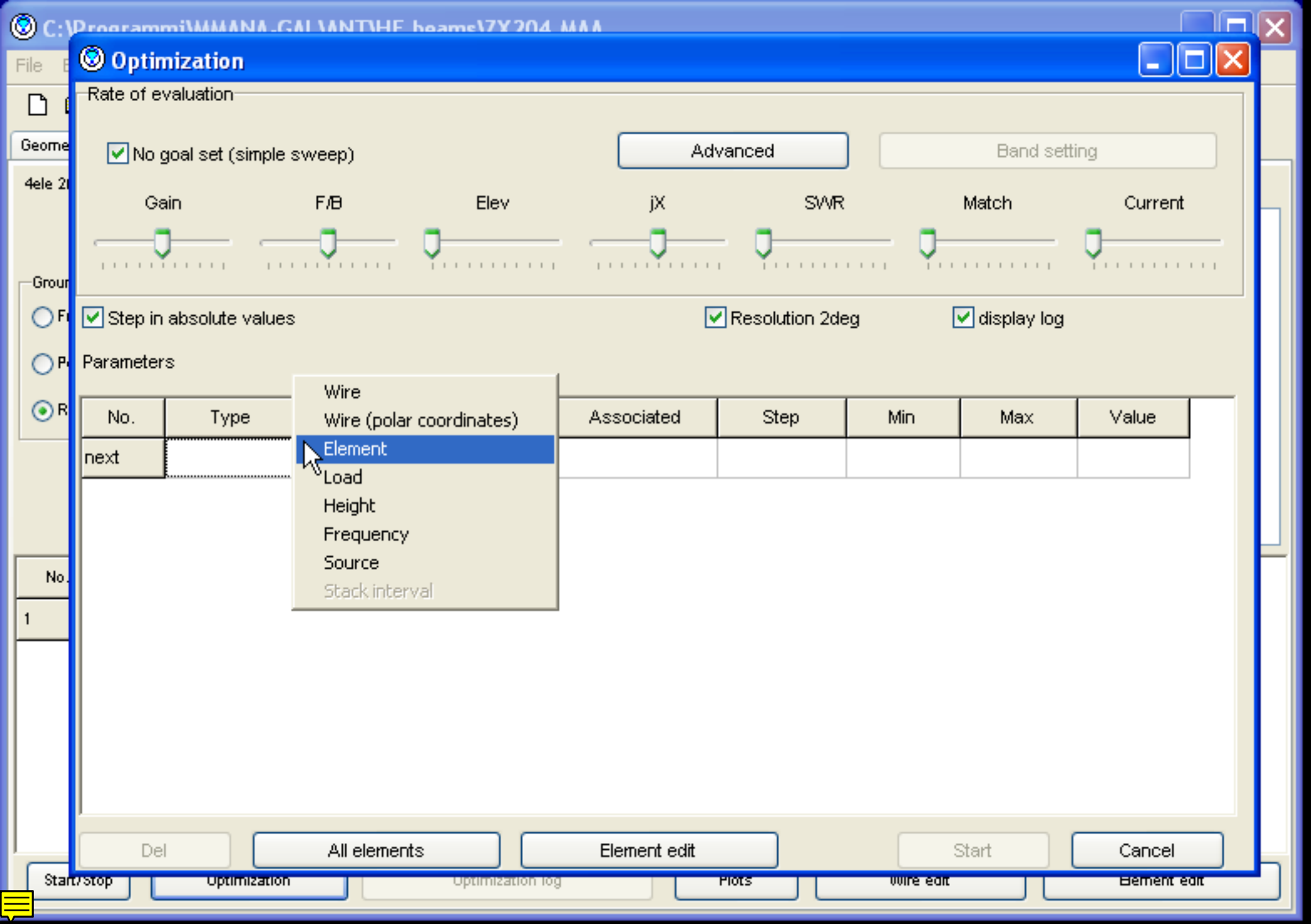
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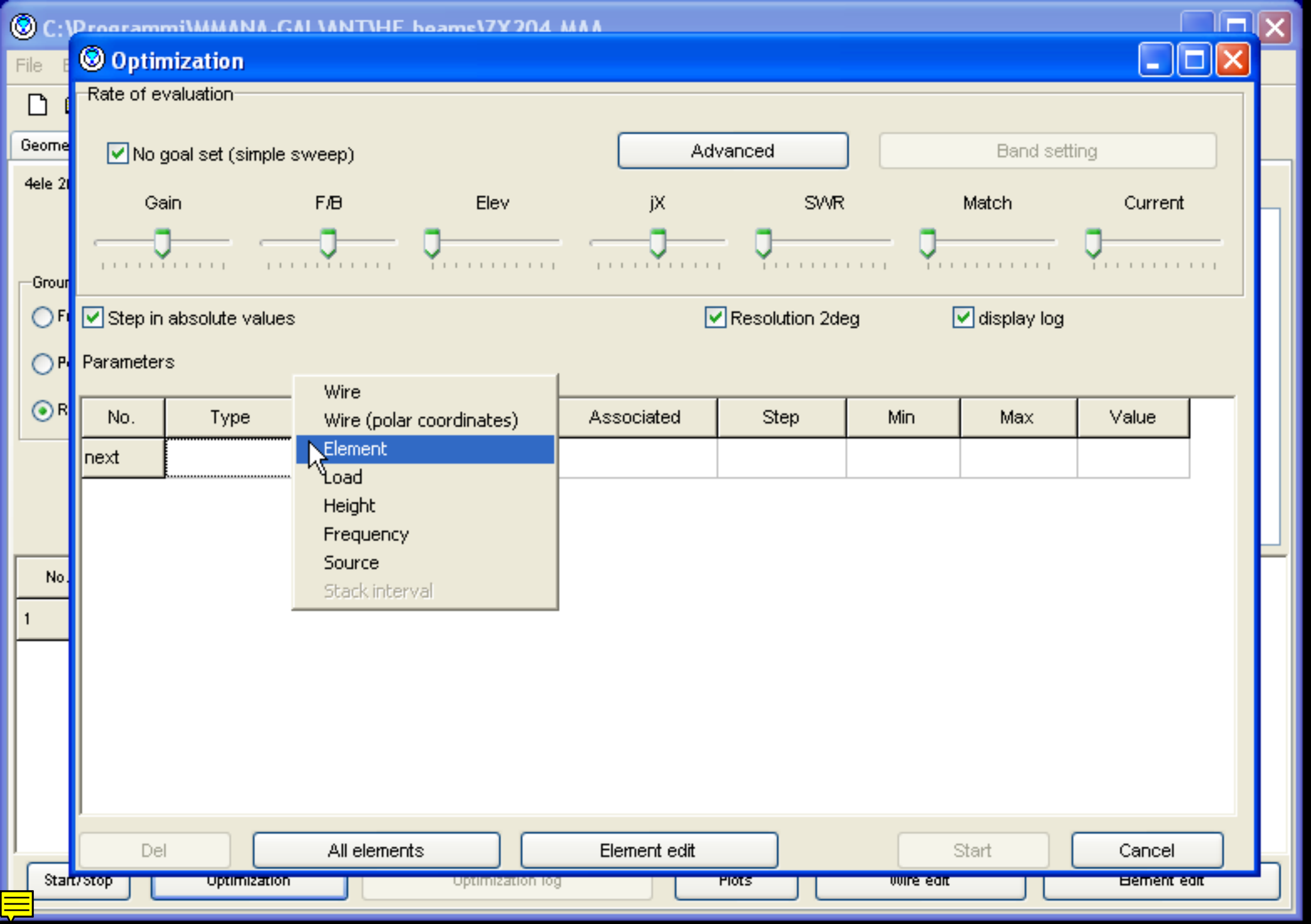
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Resolution 2deg
display log
Parameters
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Plots
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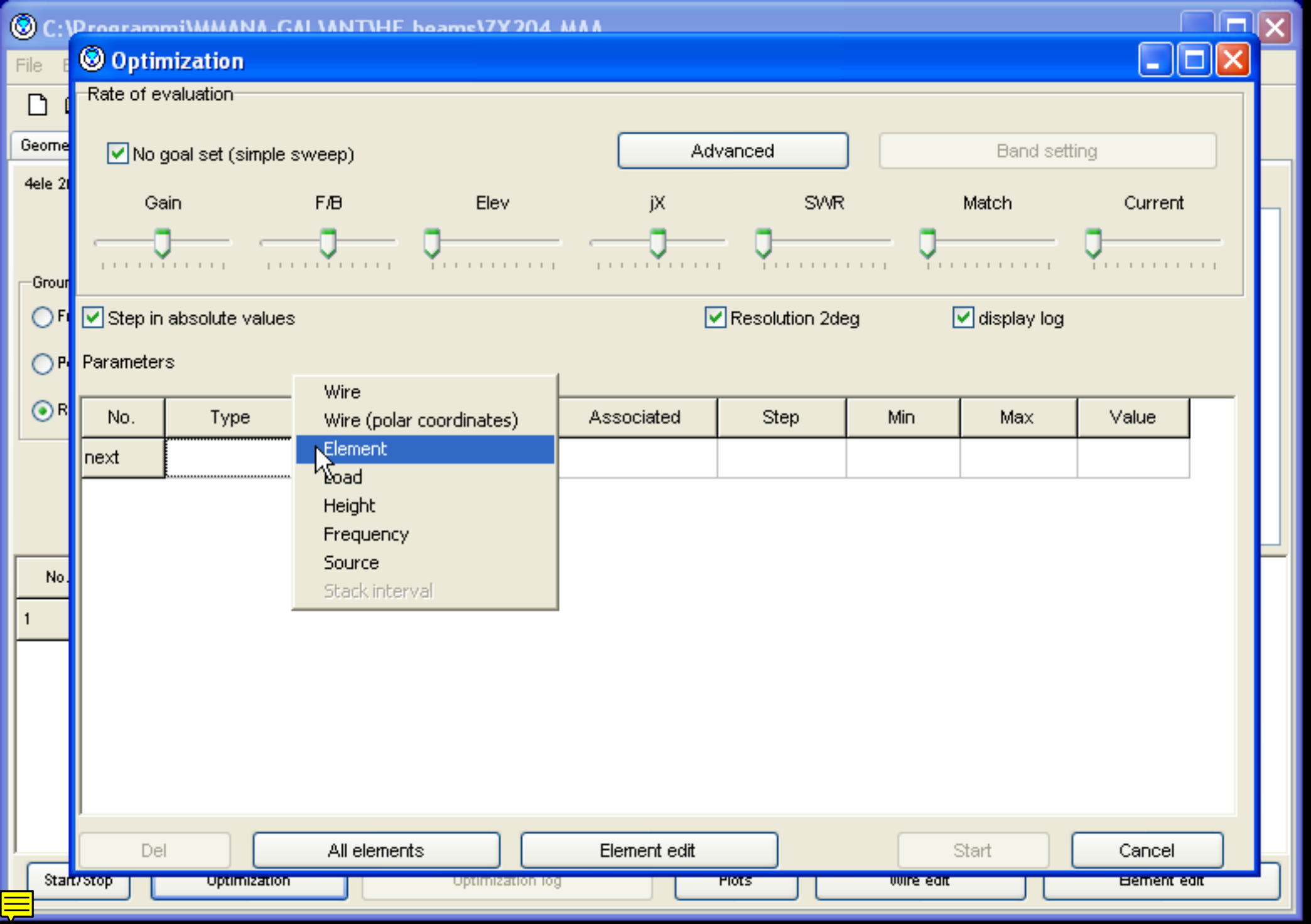
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Rate of evaluation
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Band setting
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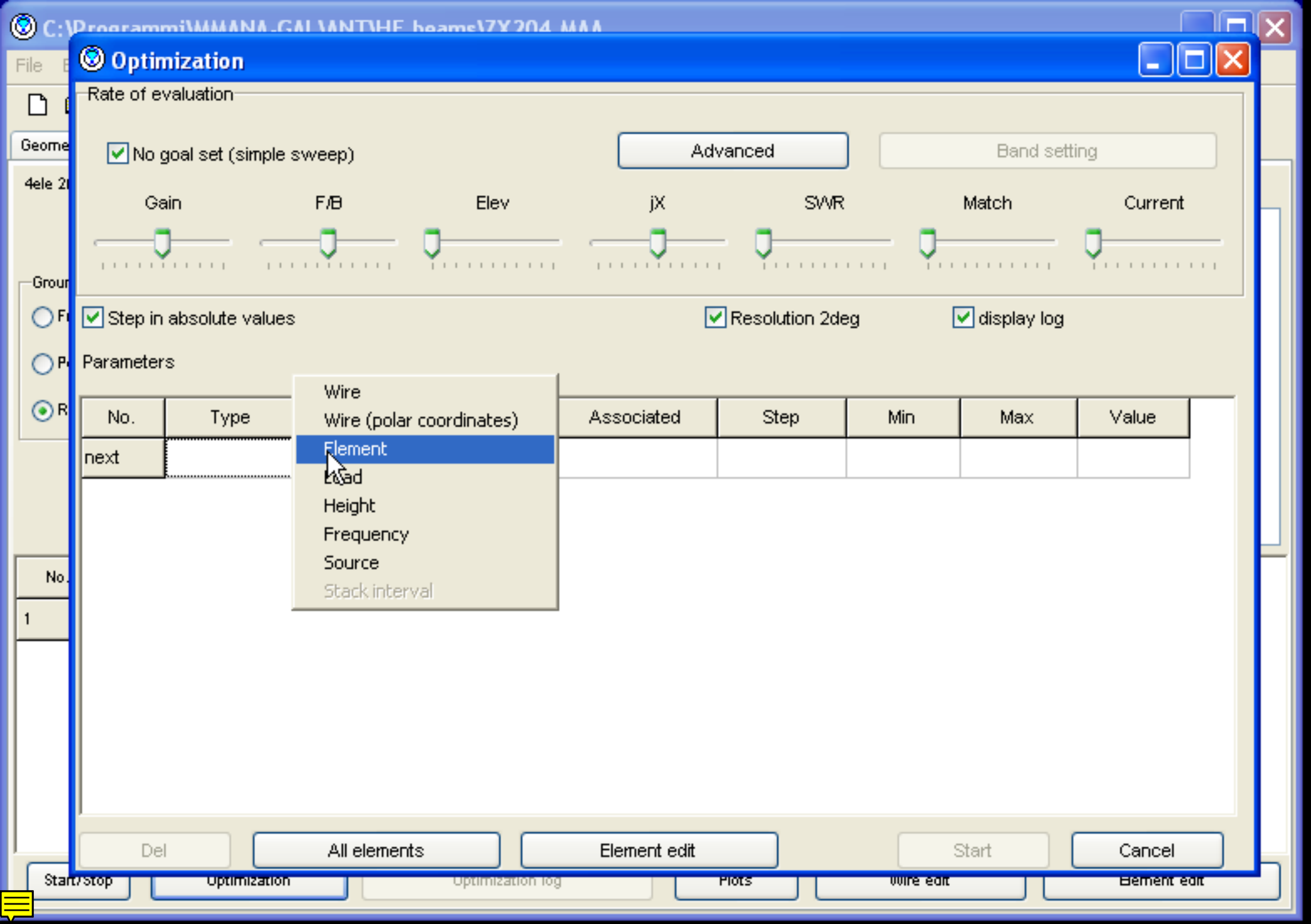
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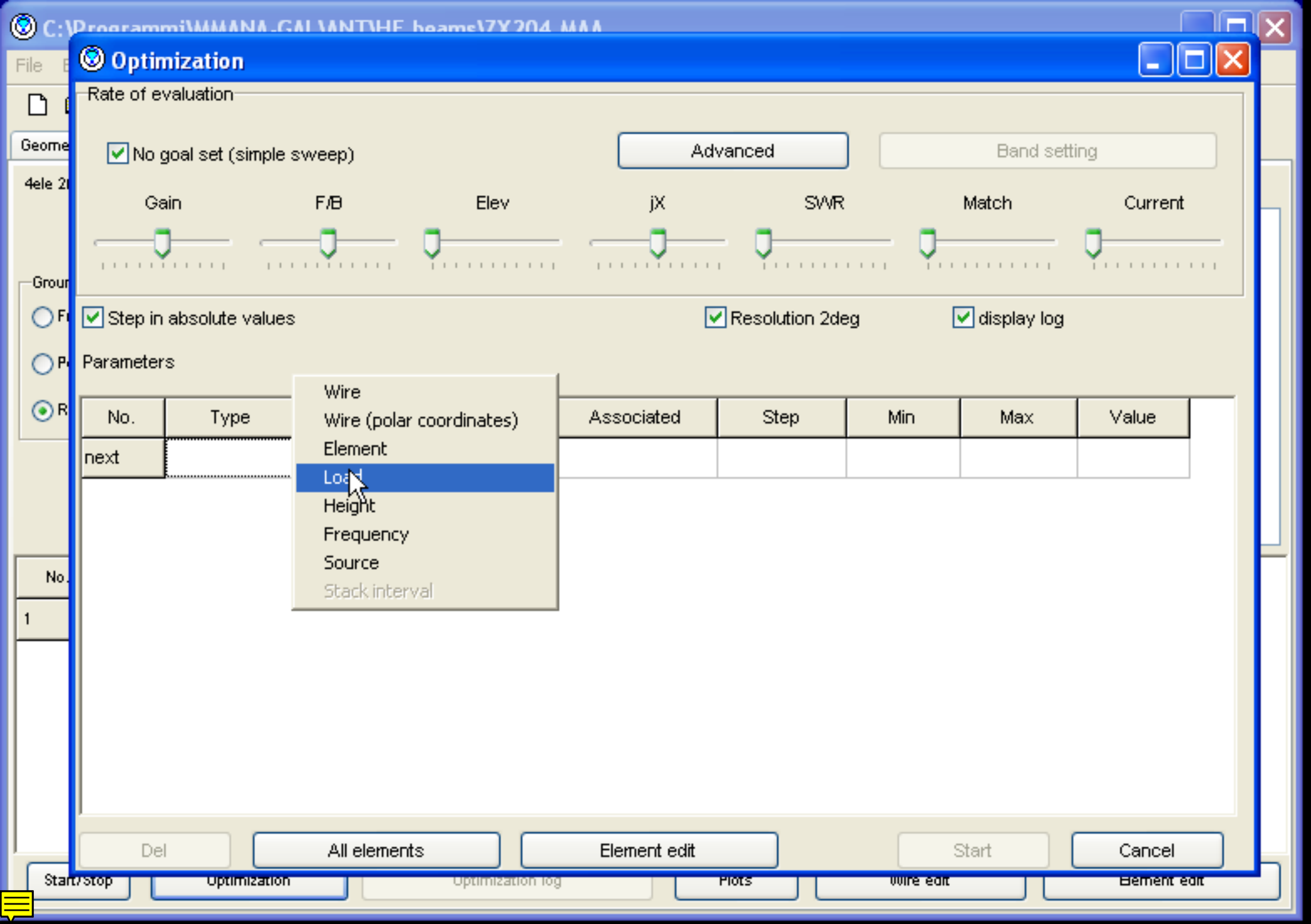
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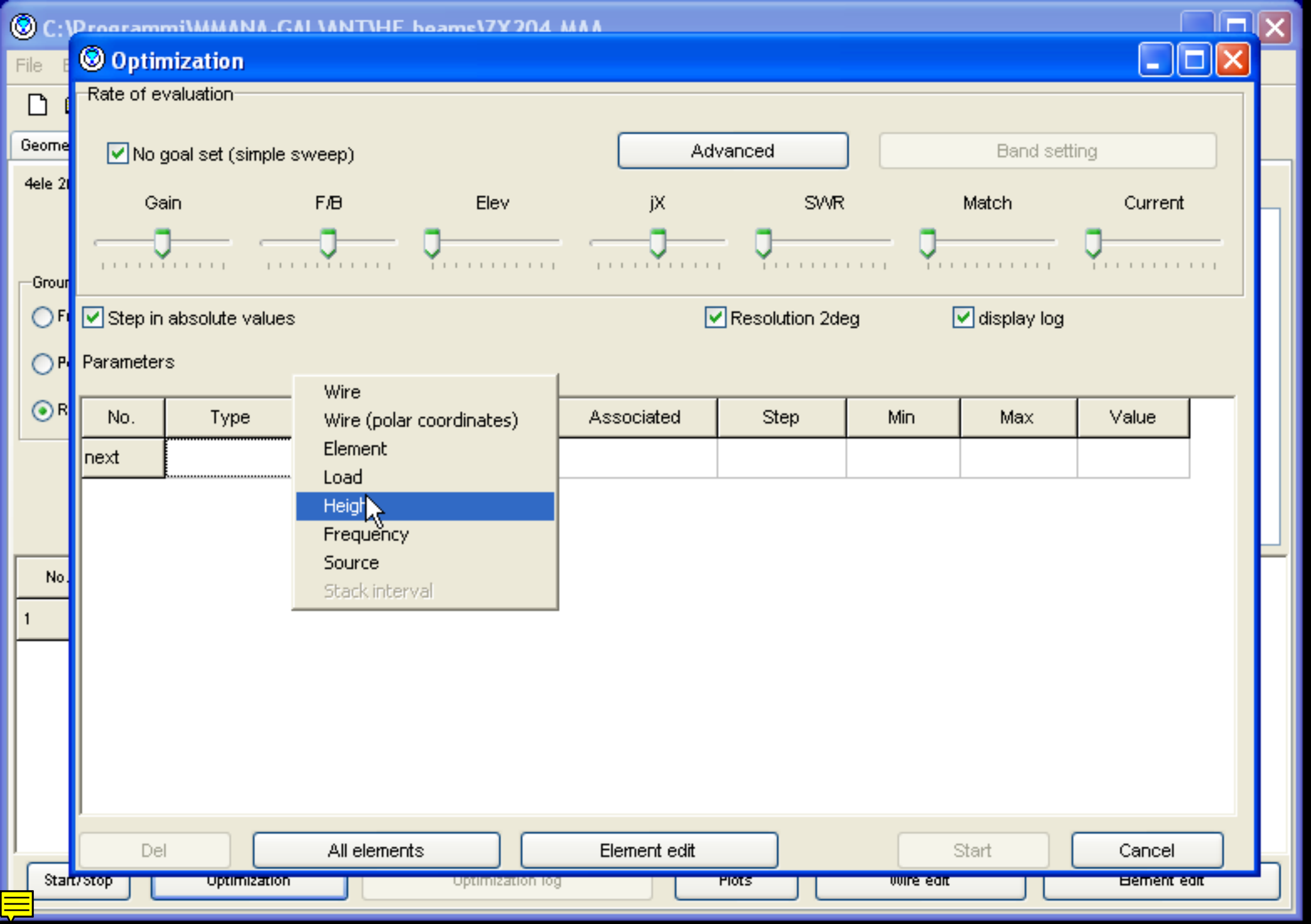
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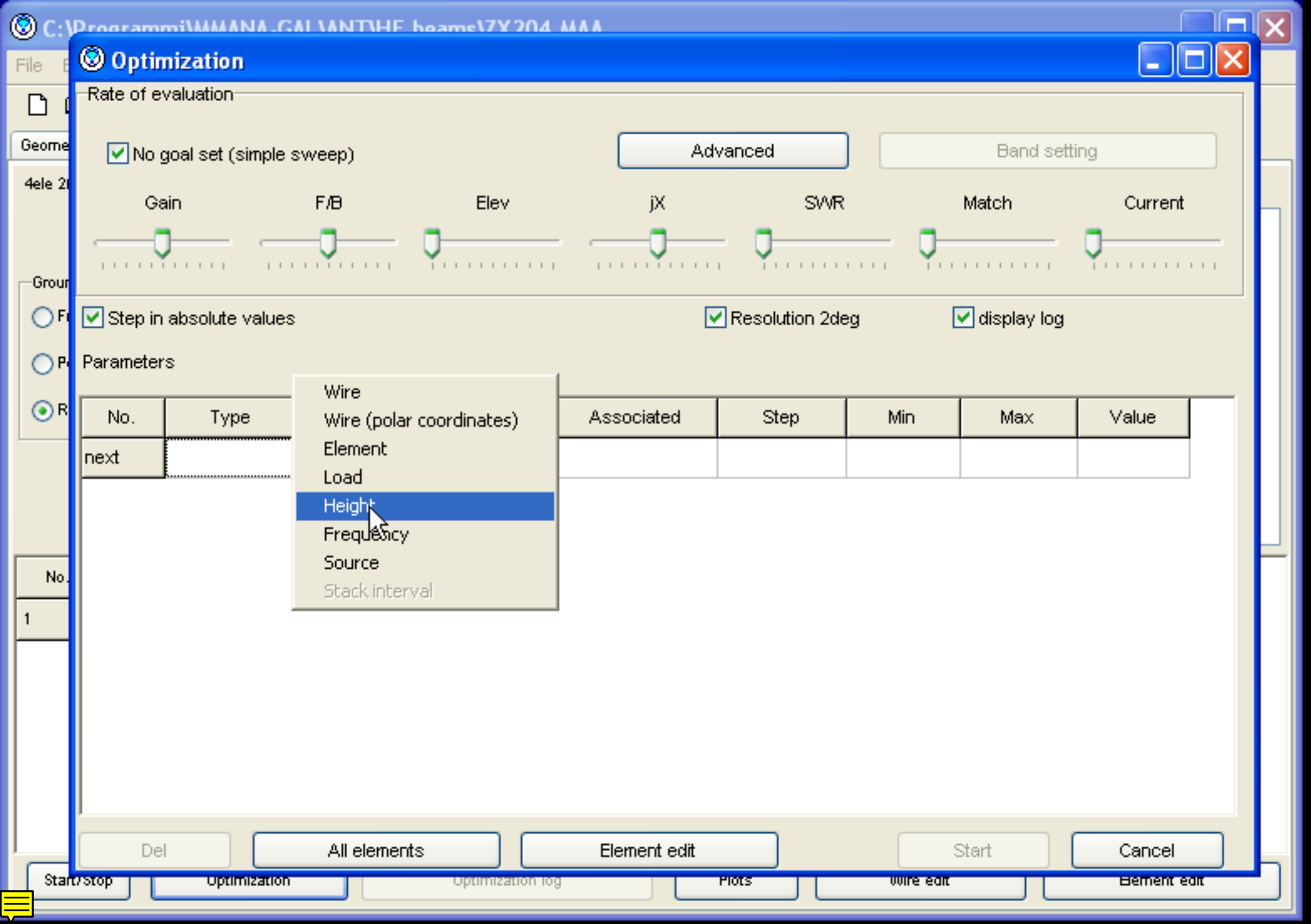
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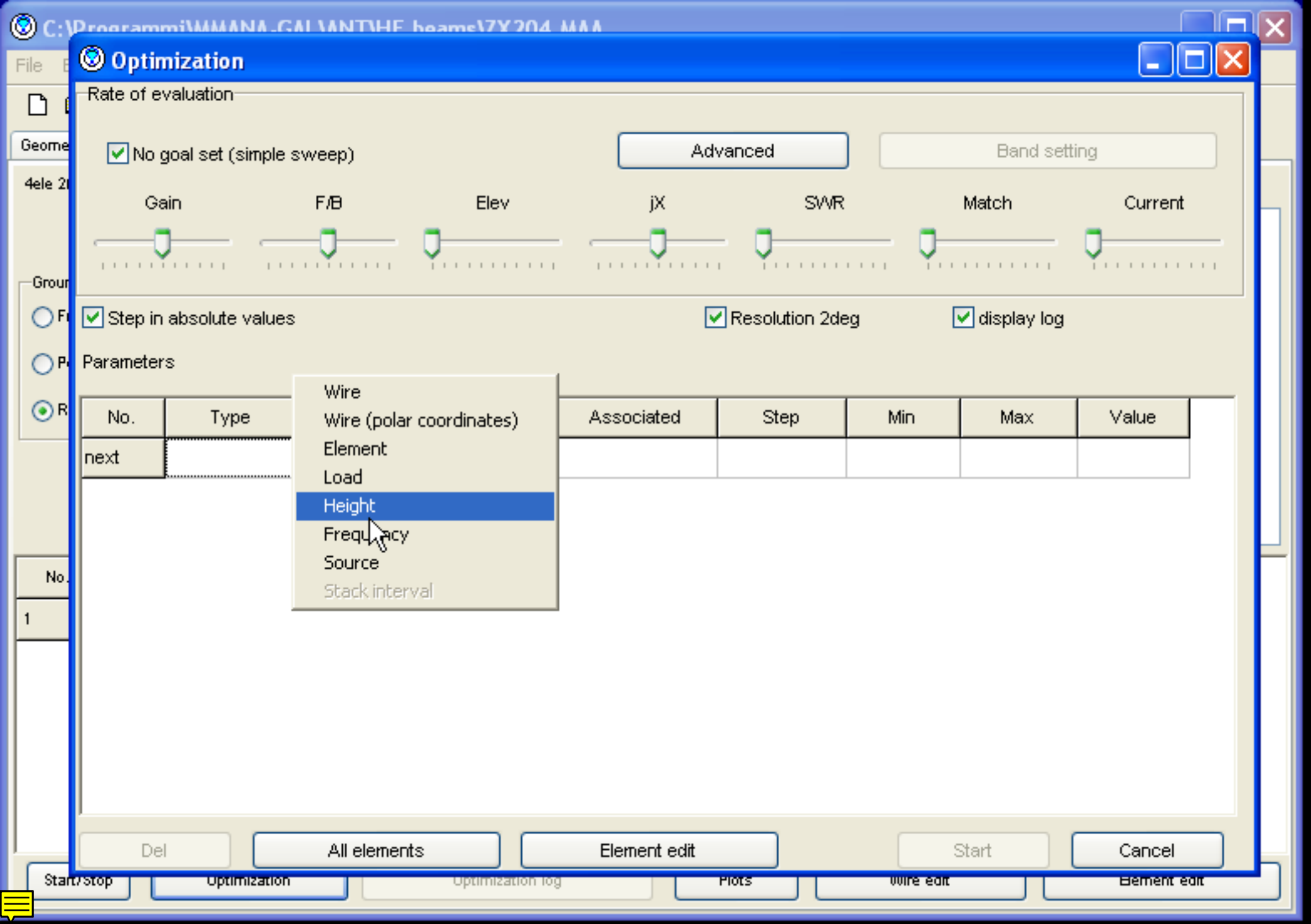
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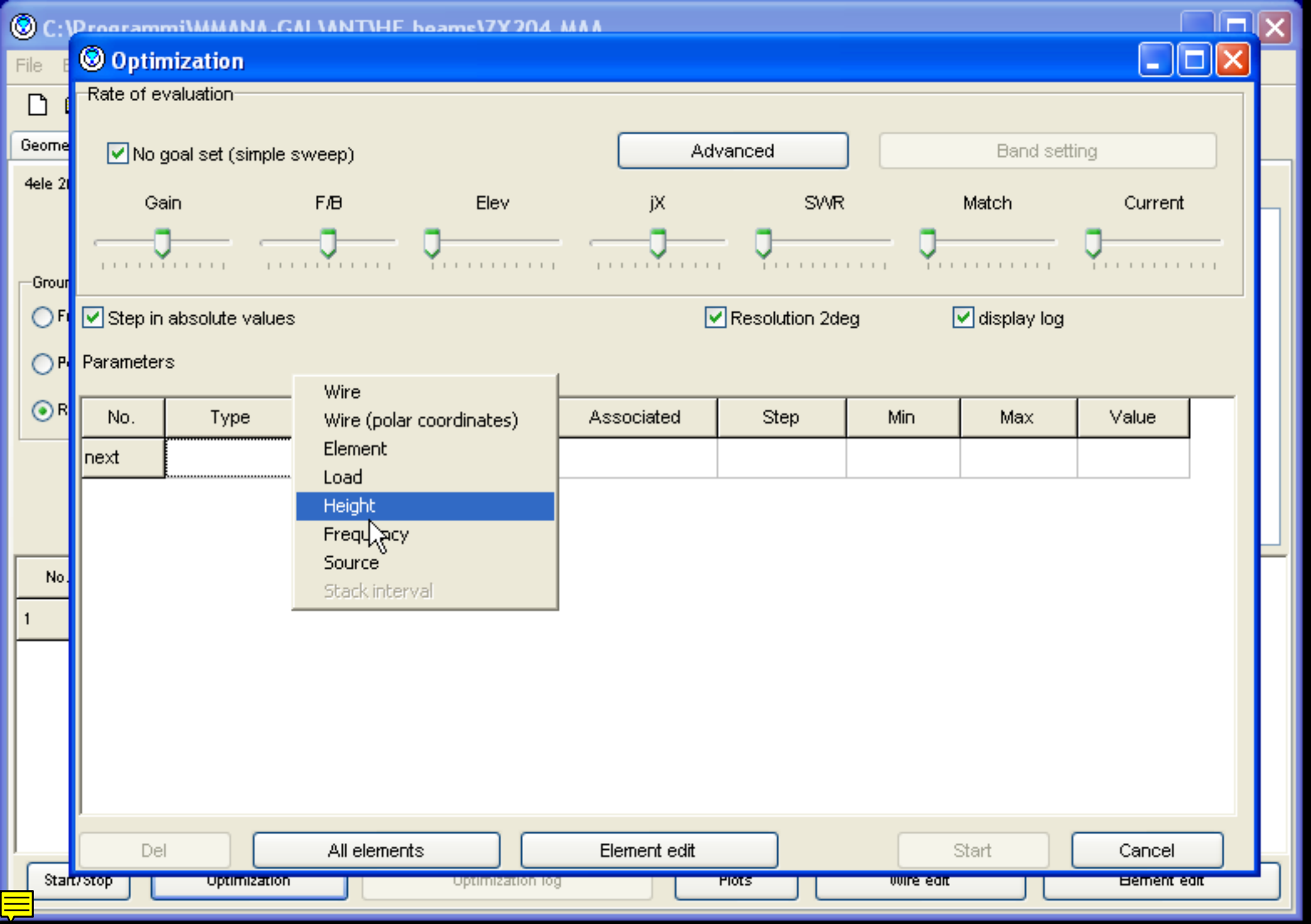
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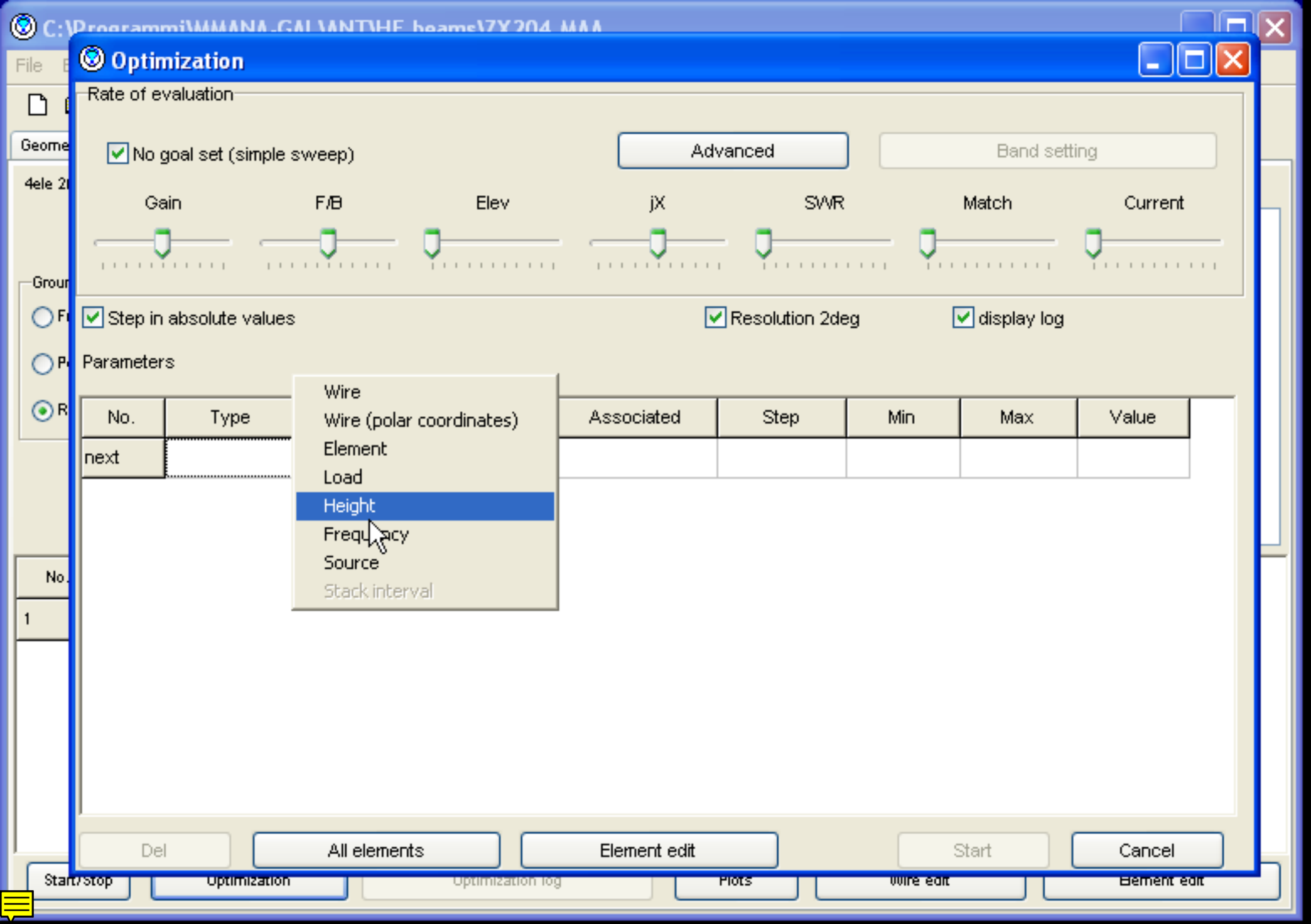
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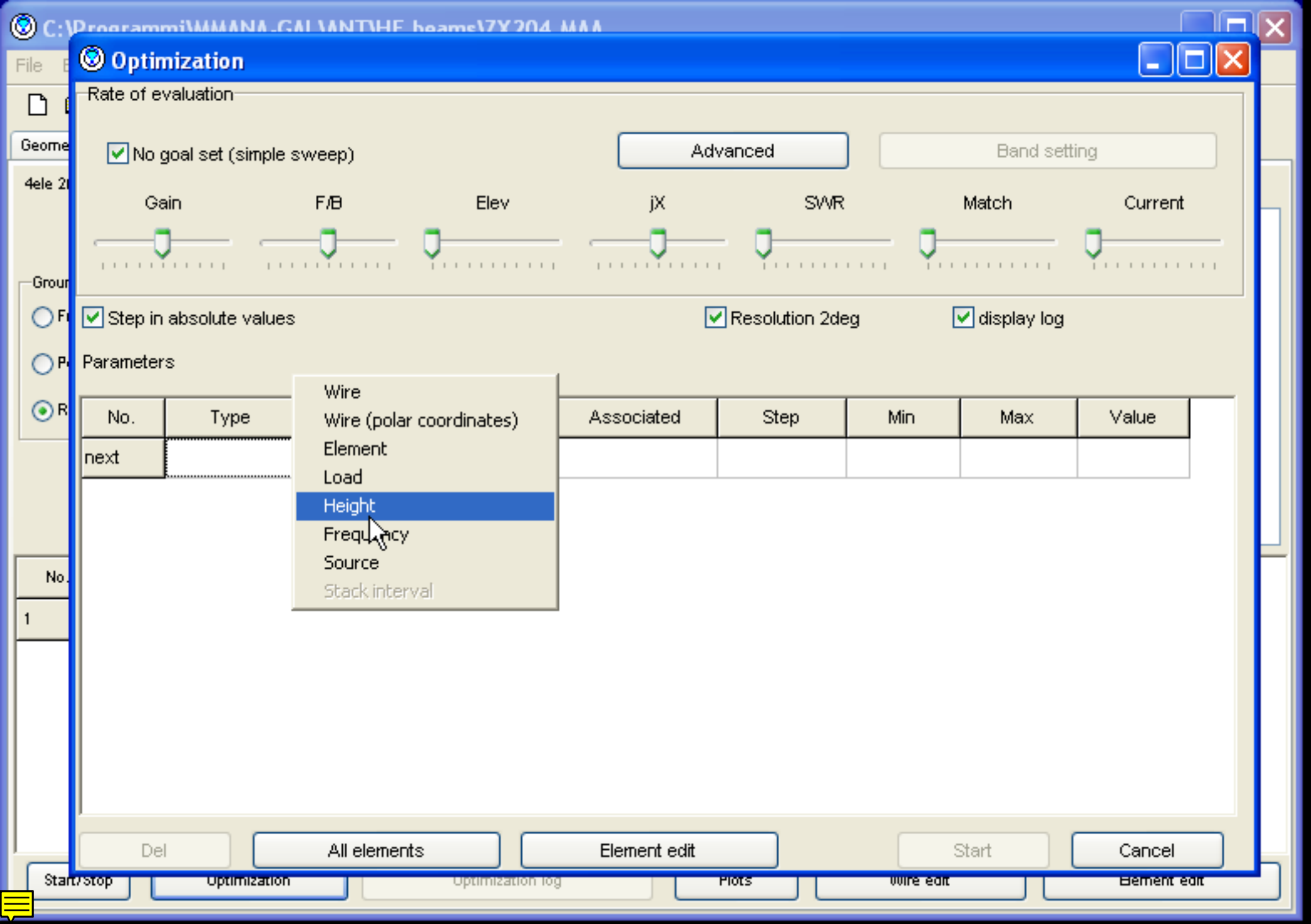
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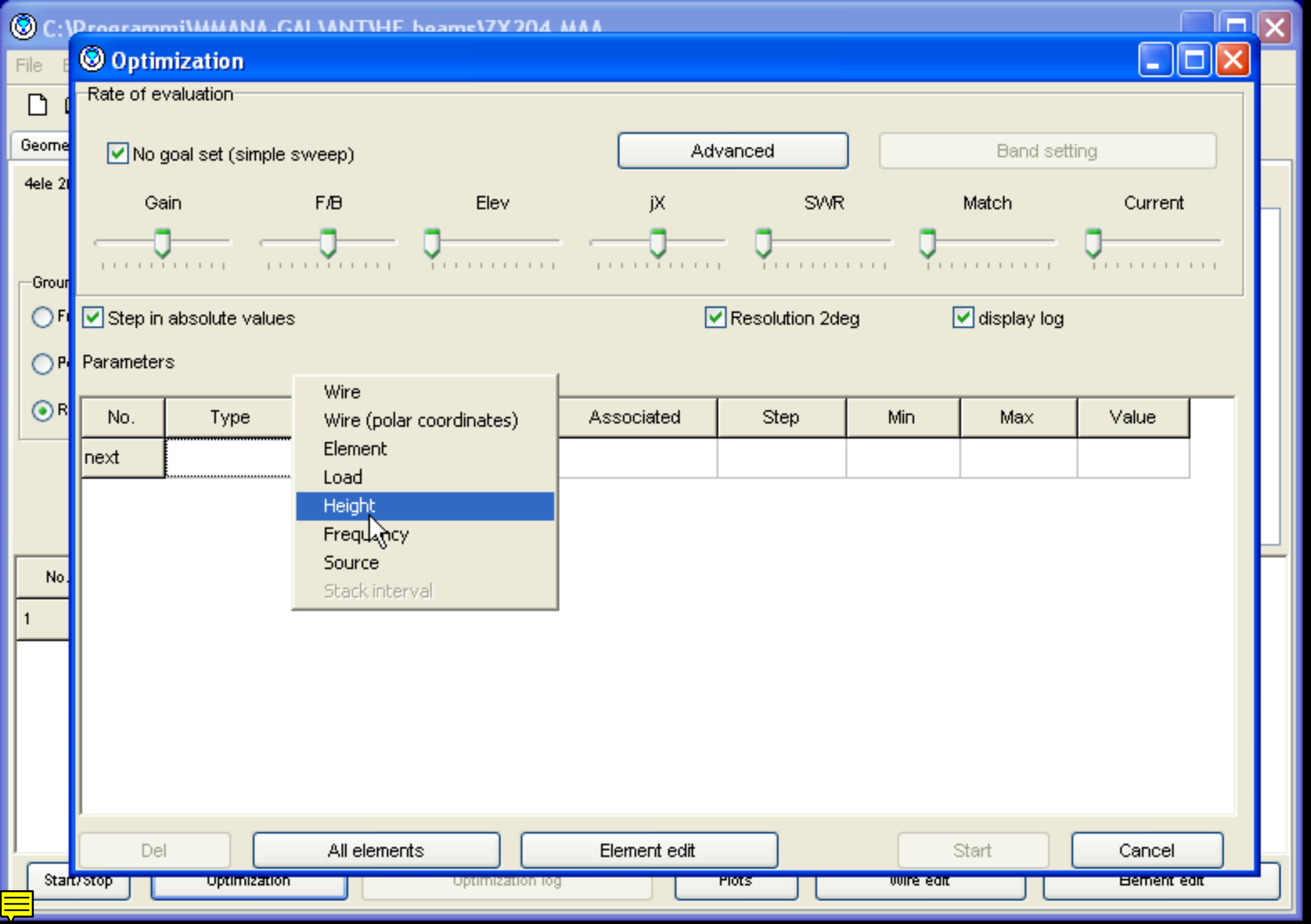
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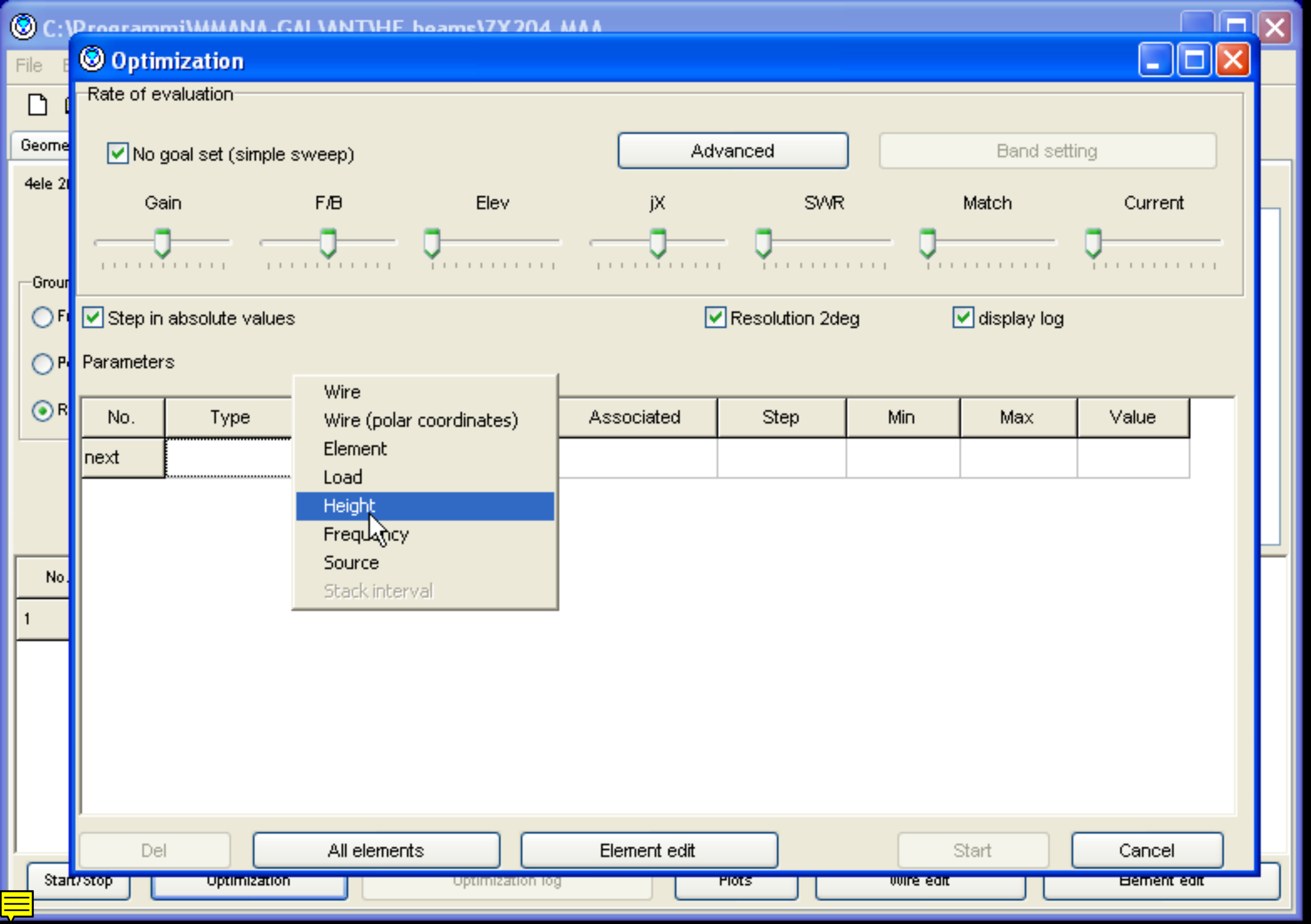
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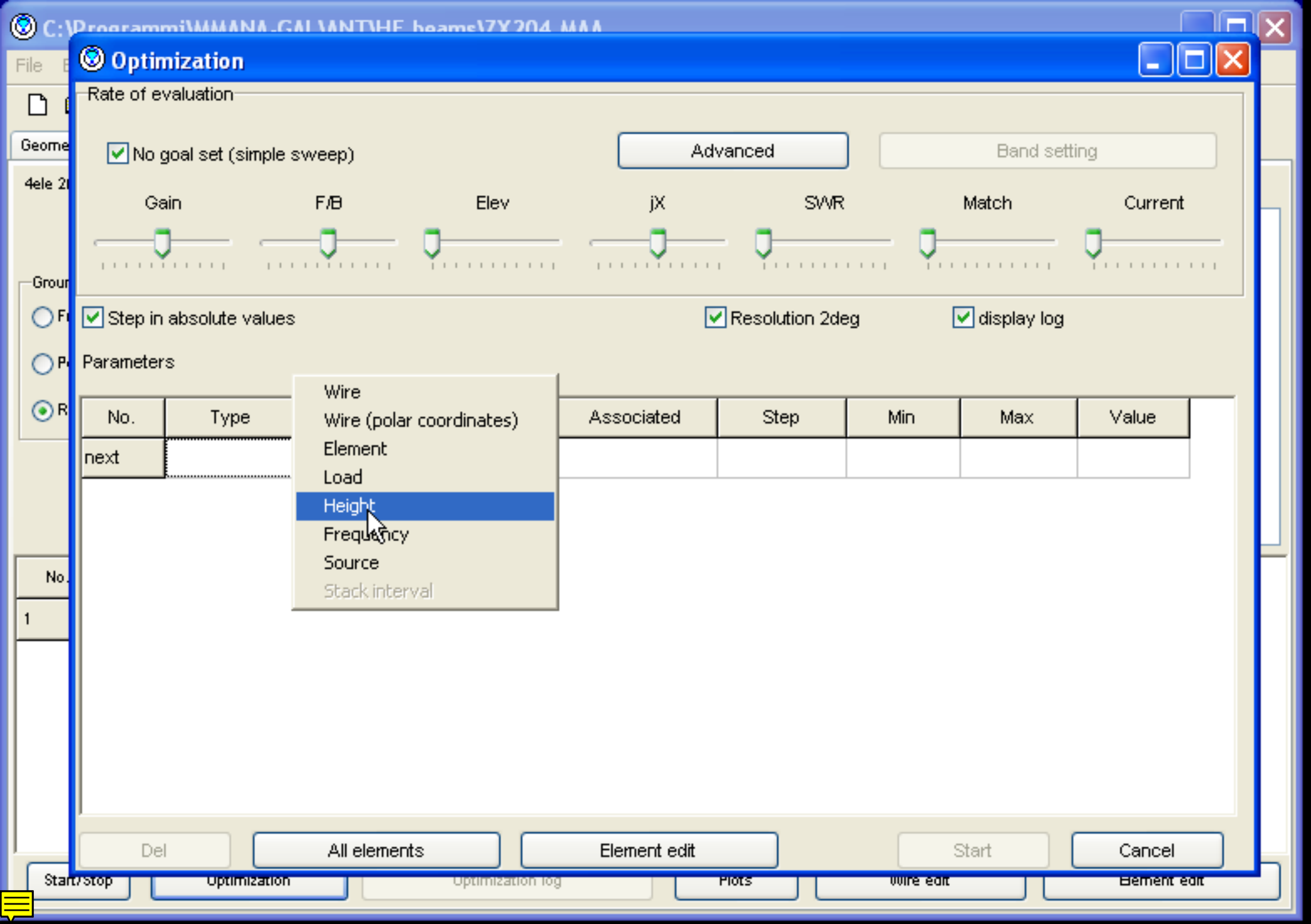
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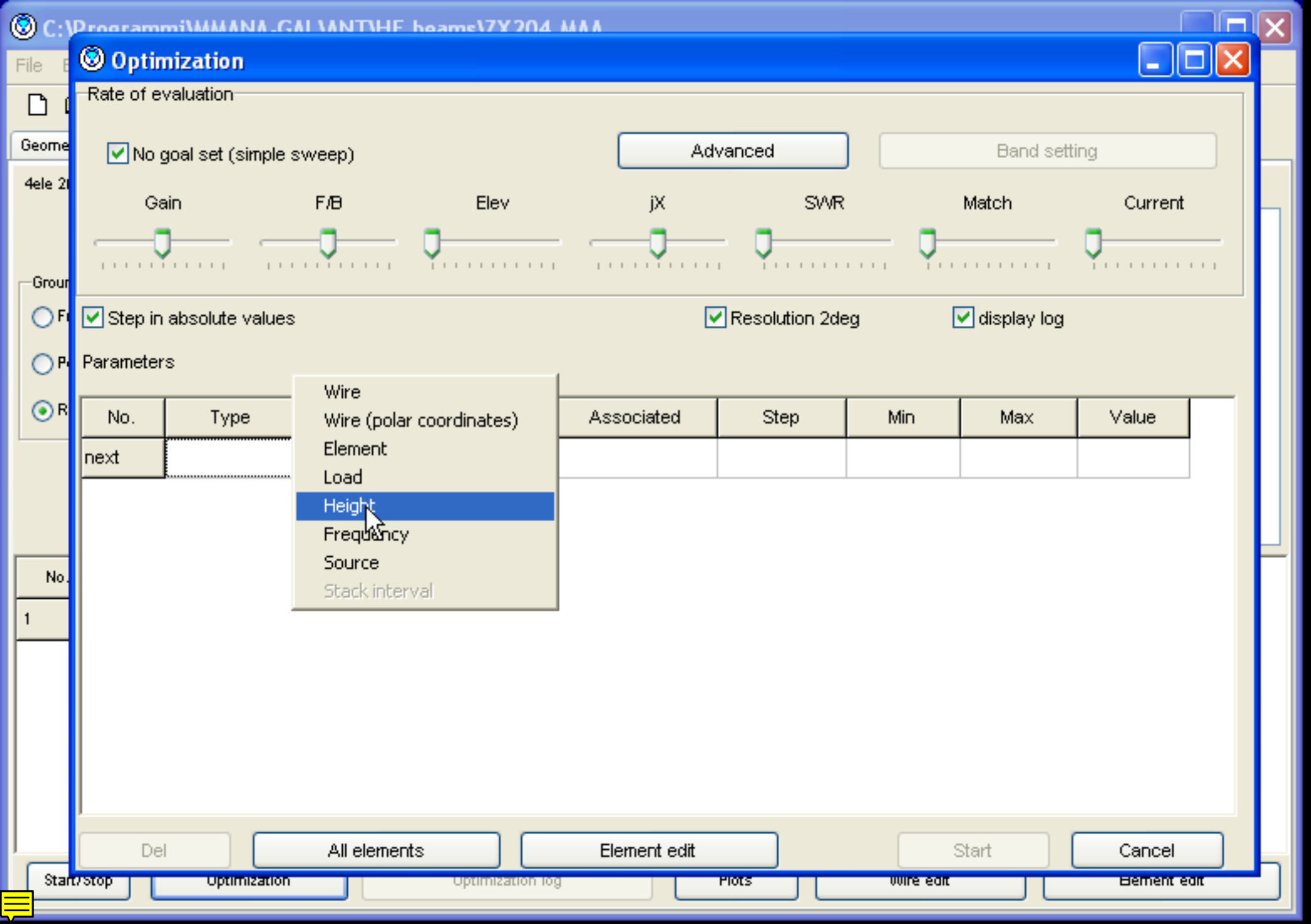
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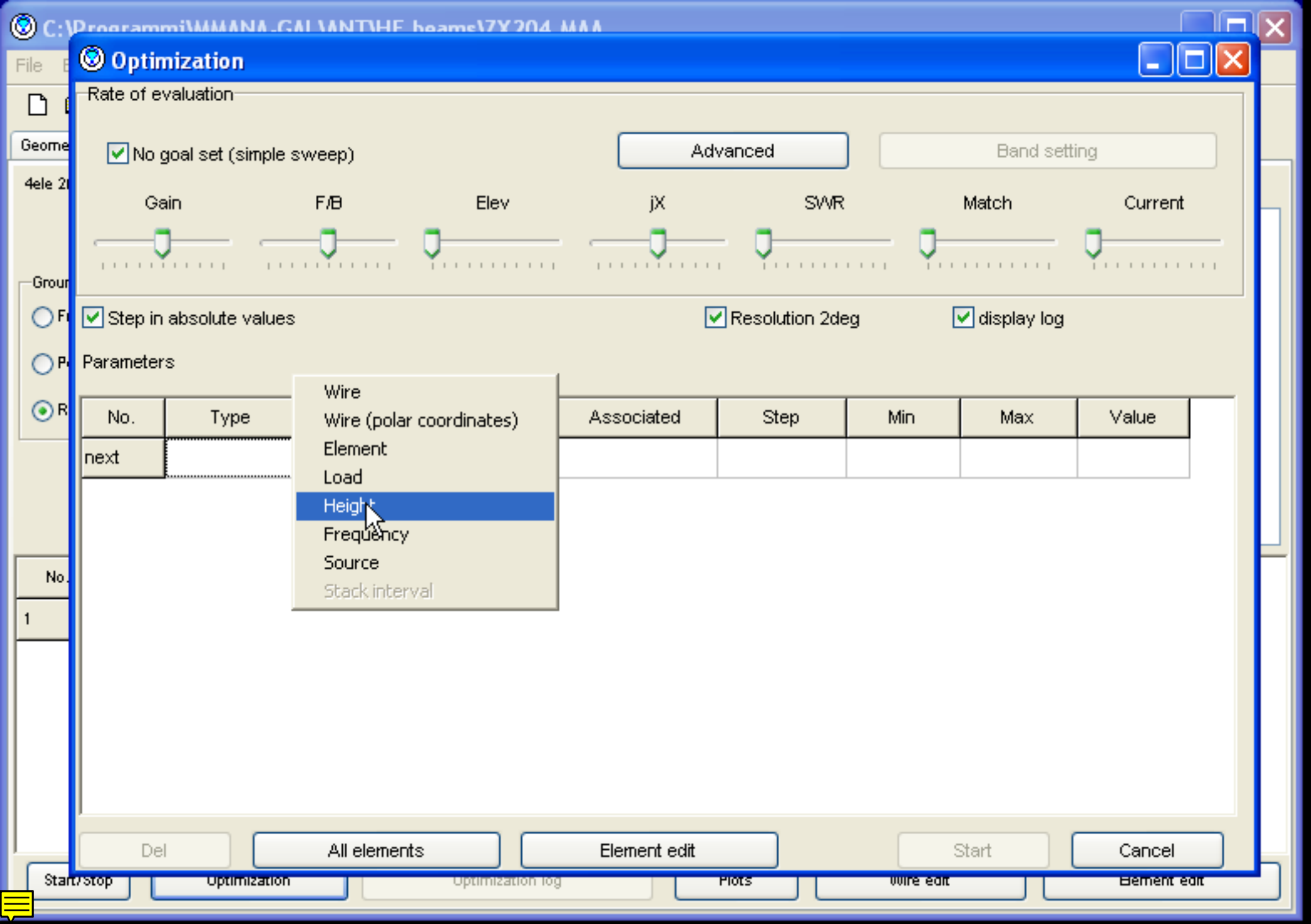
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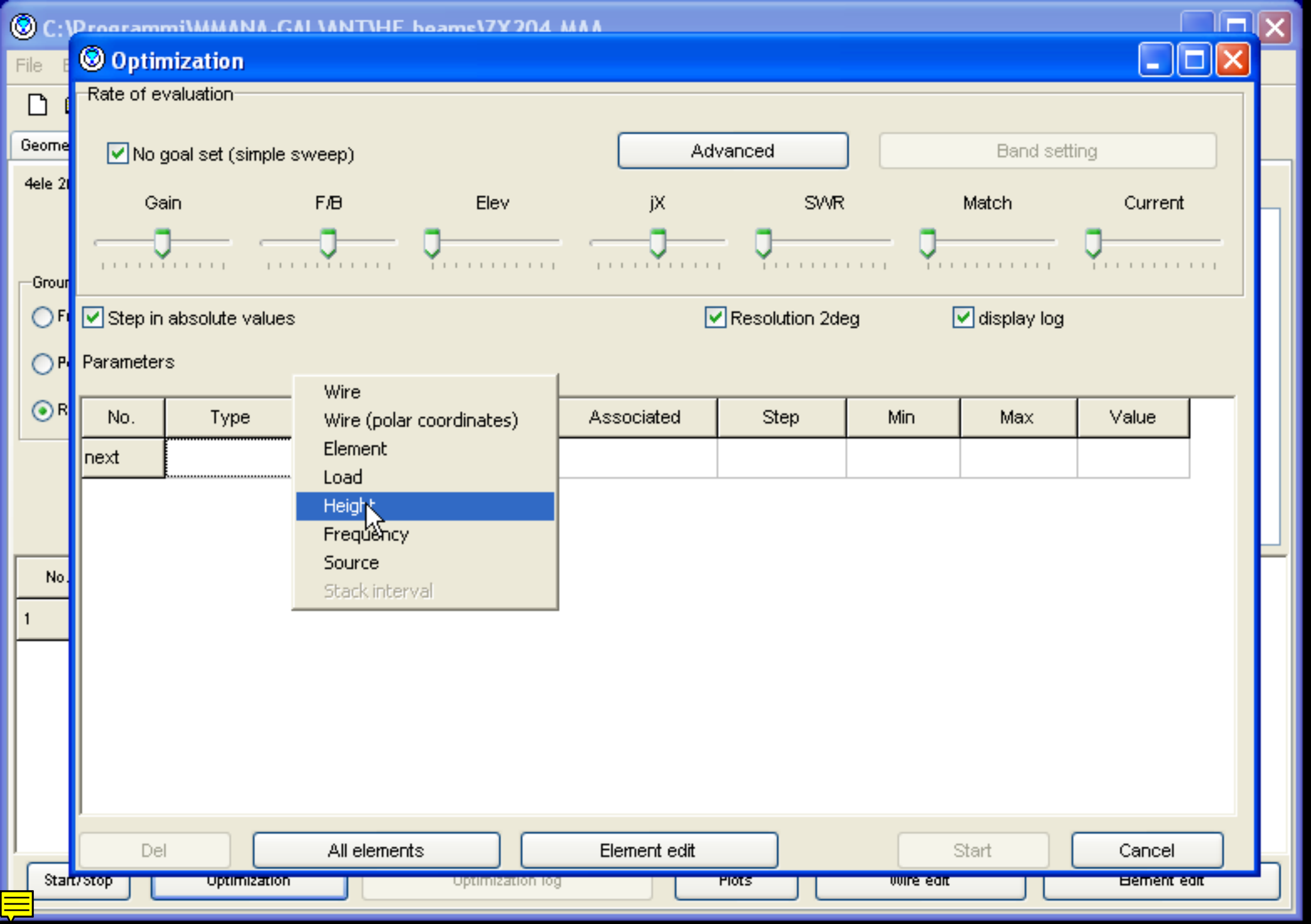
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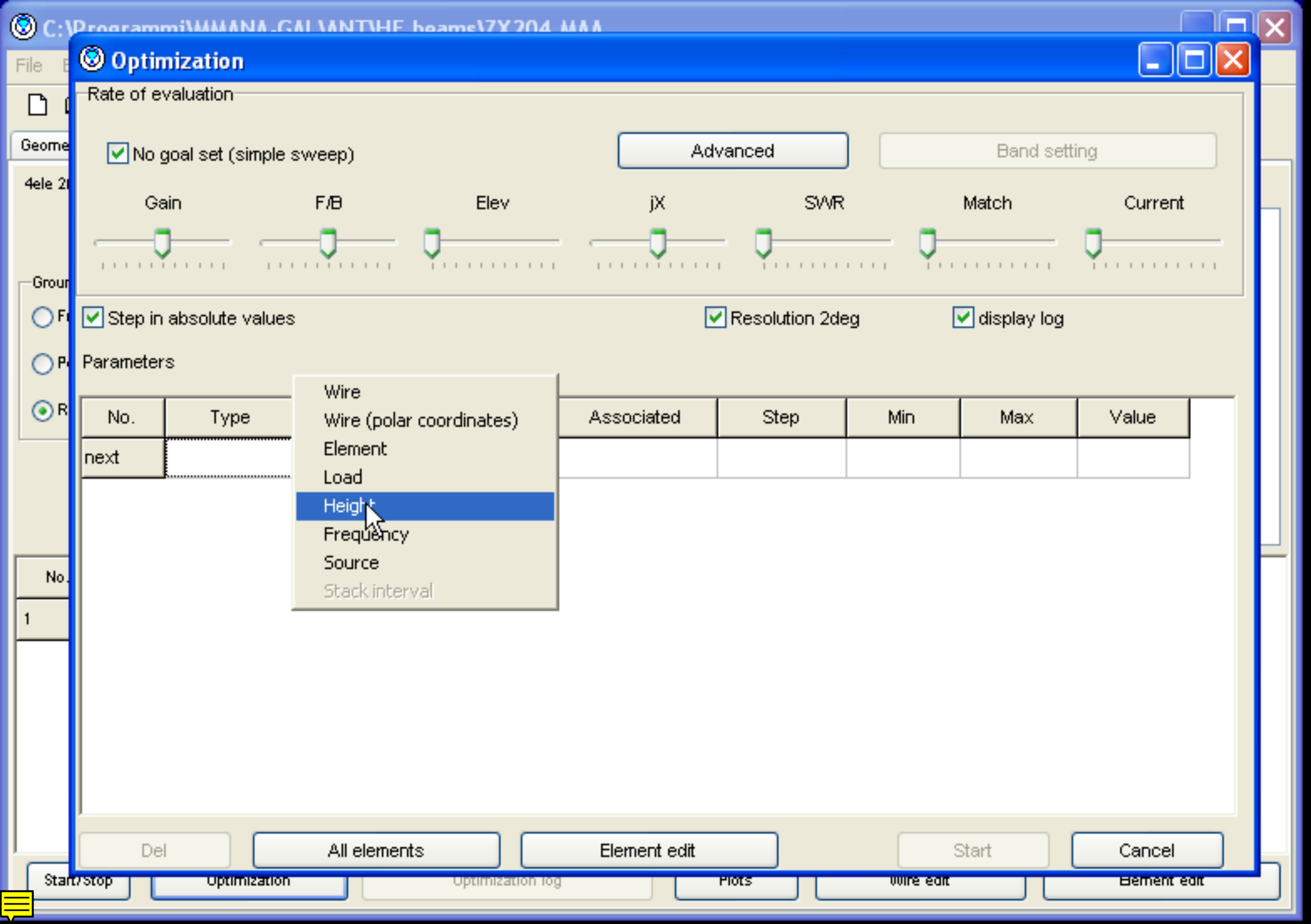
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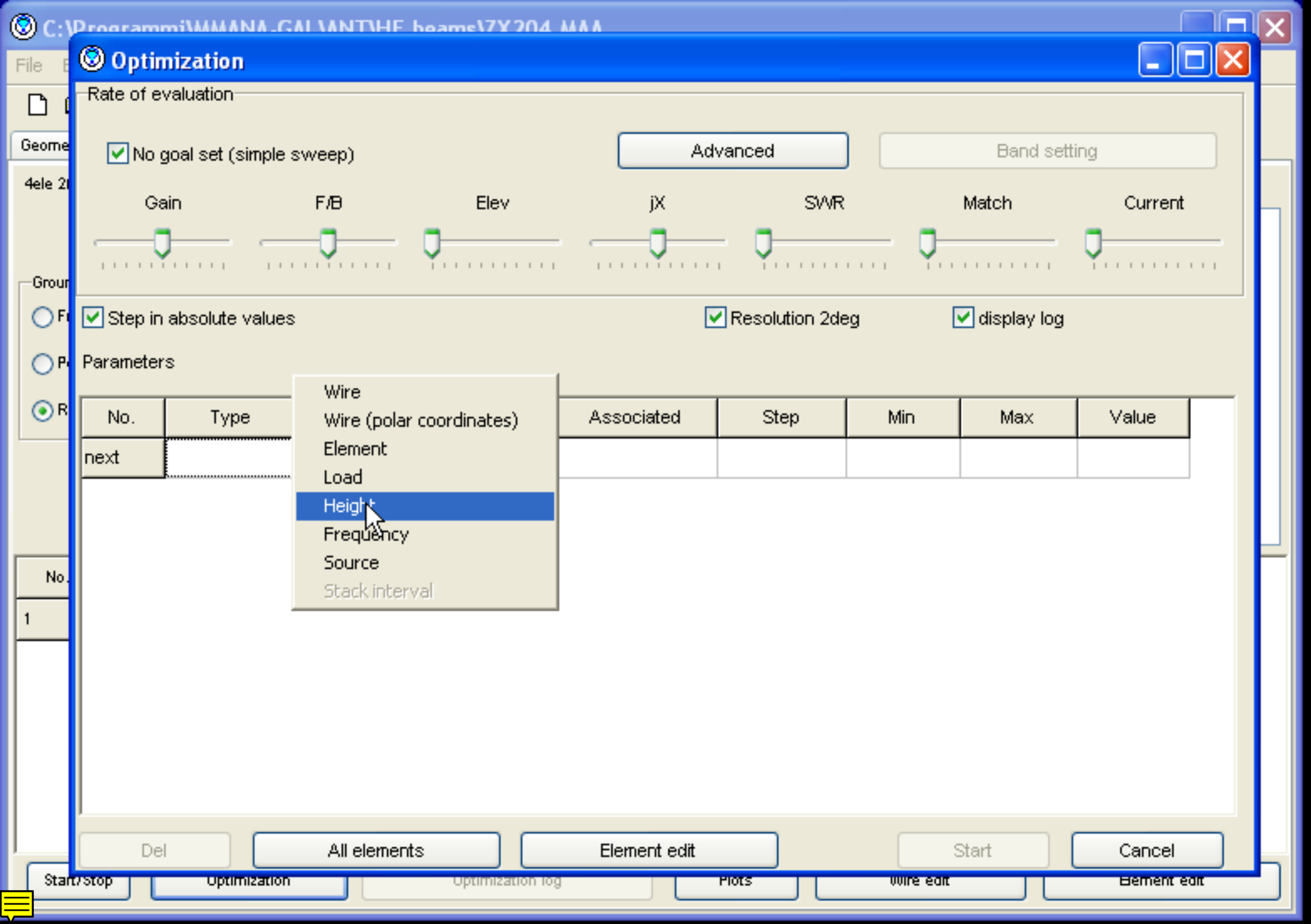
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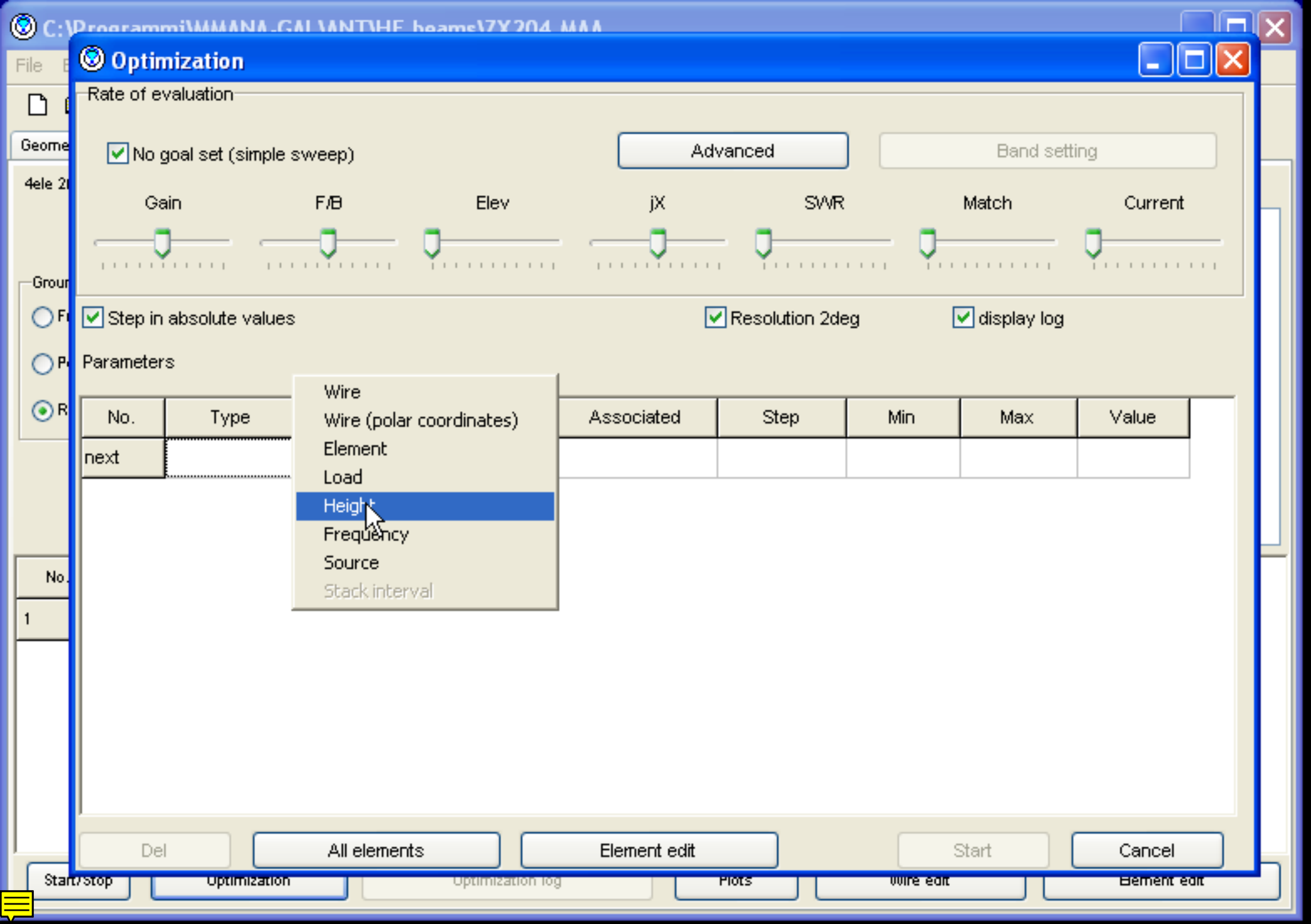
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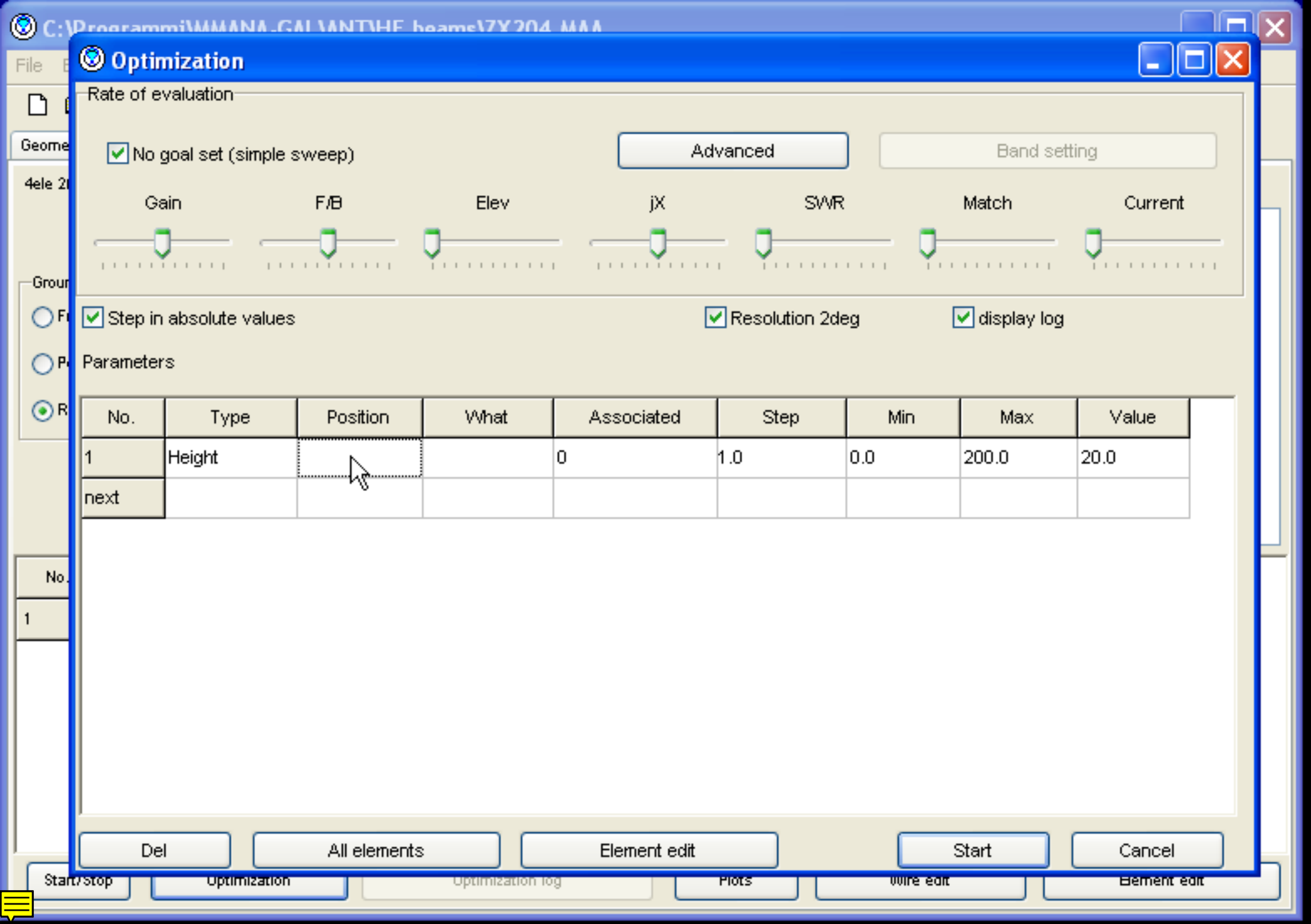
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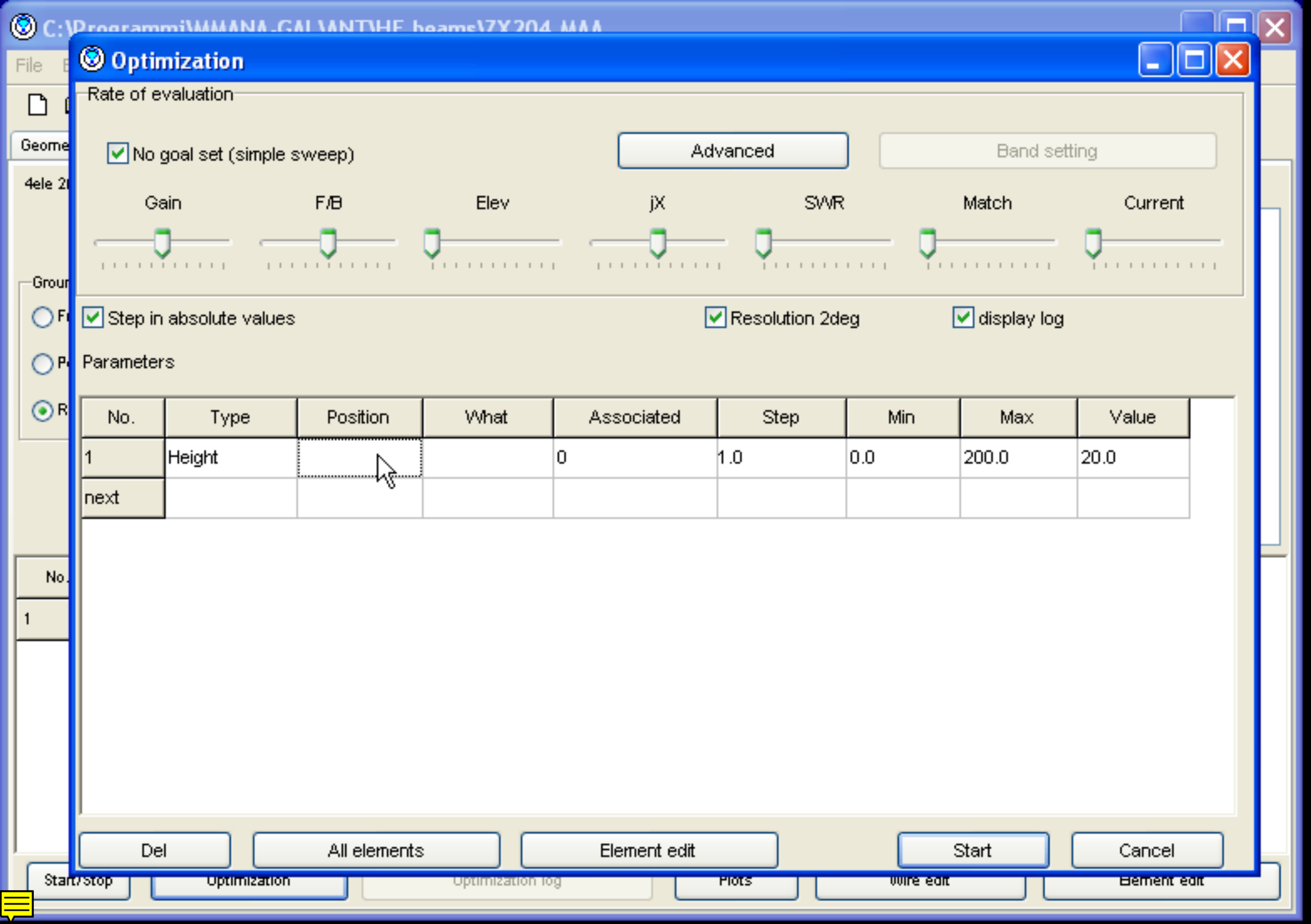
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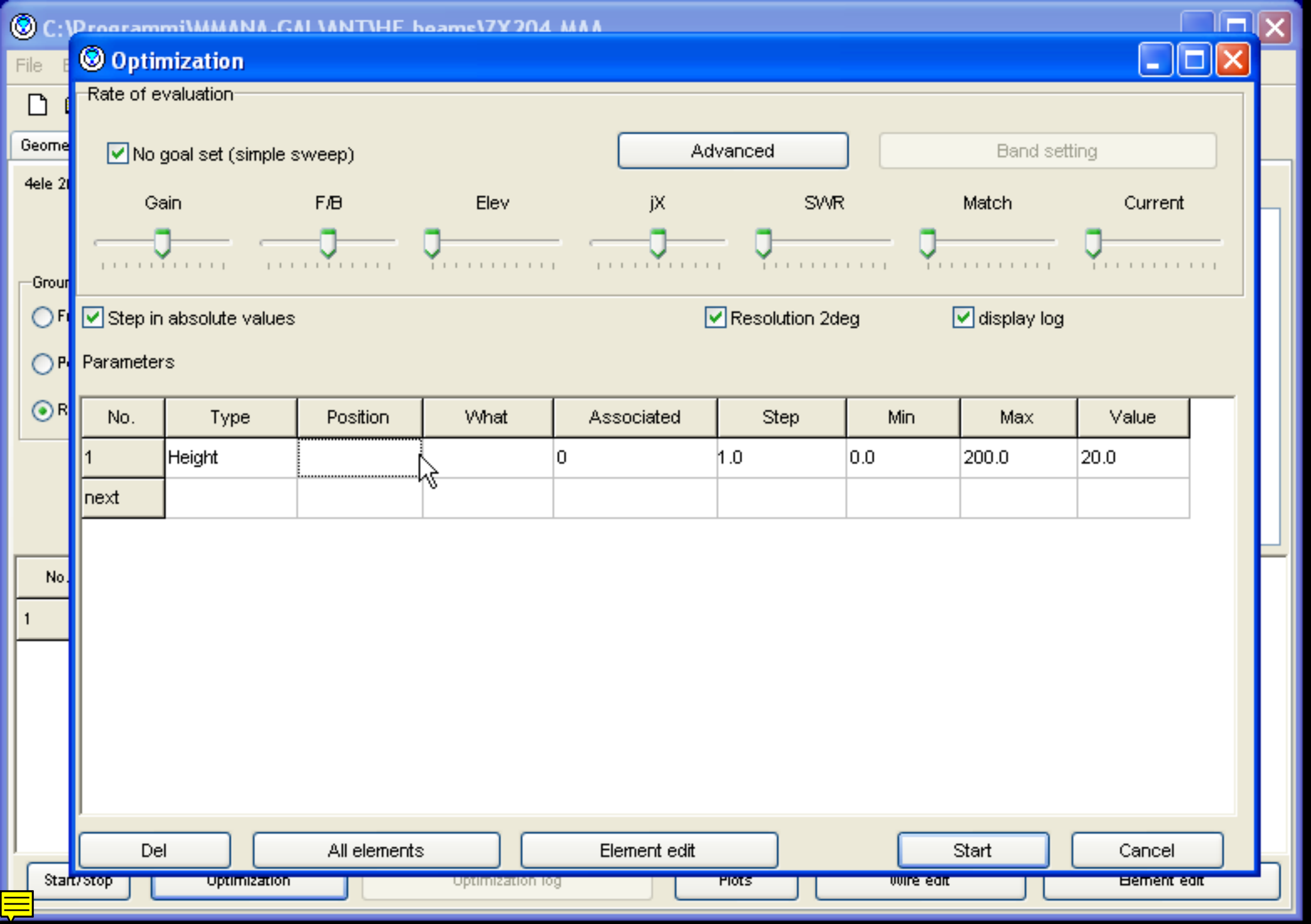
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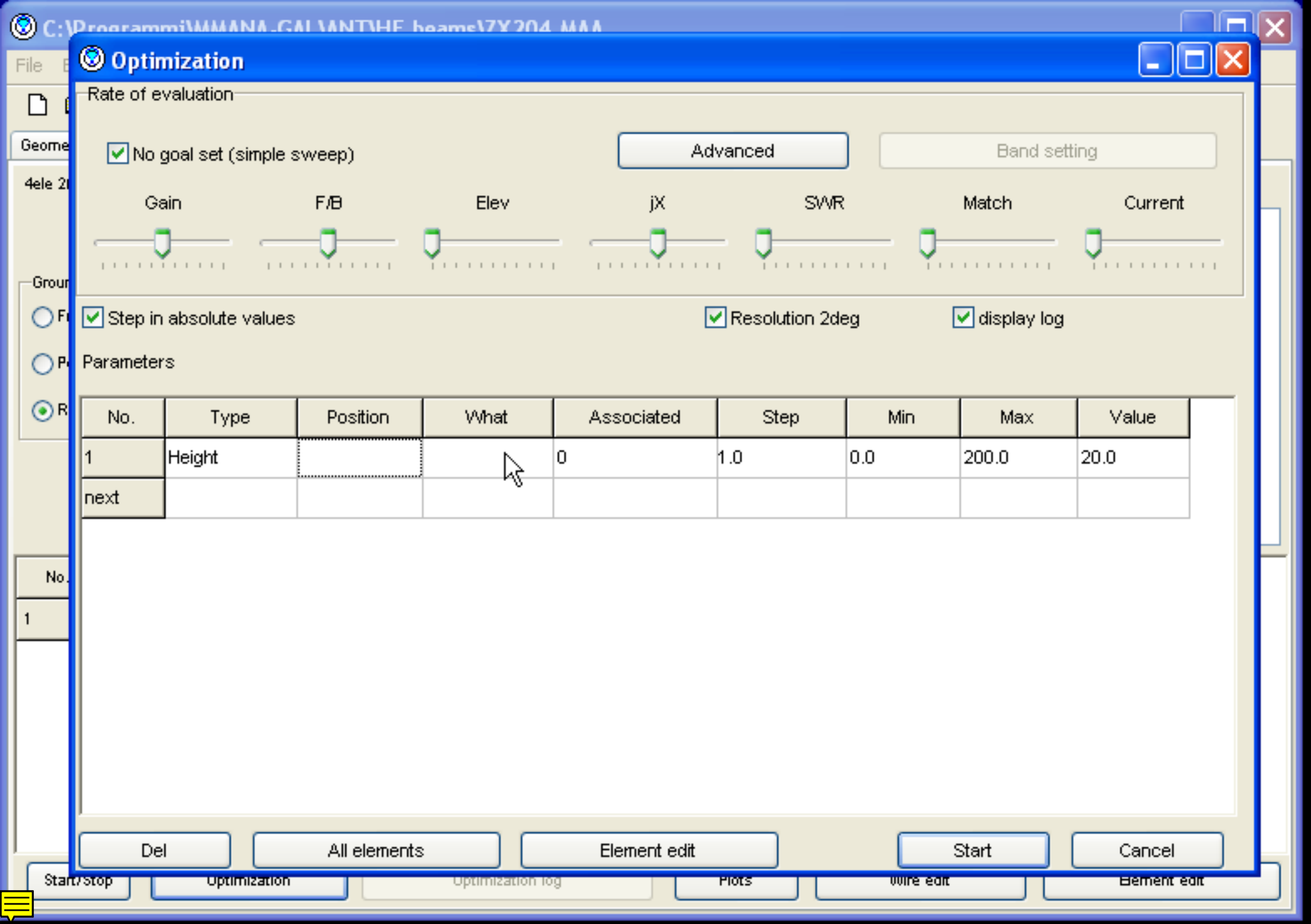
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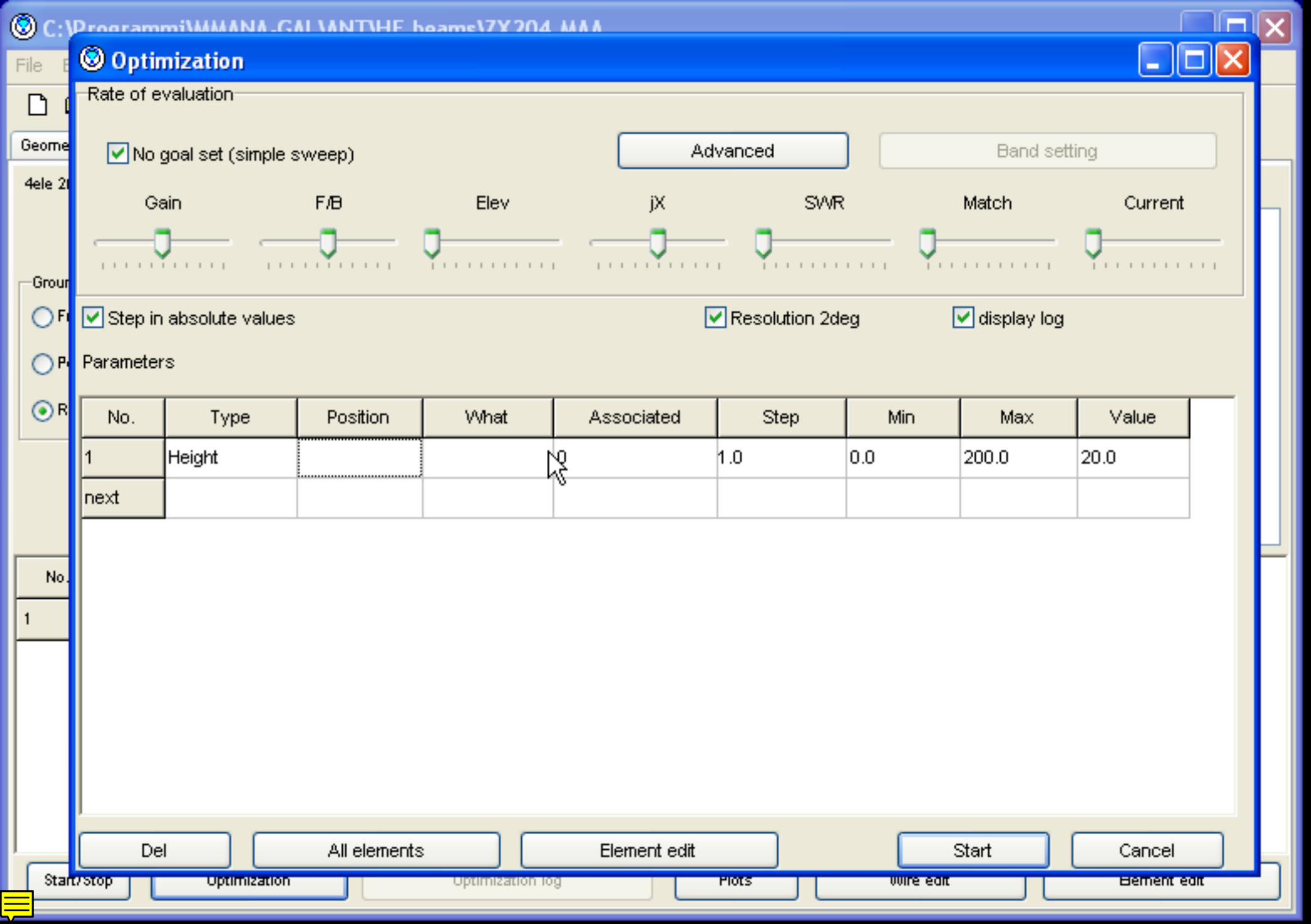
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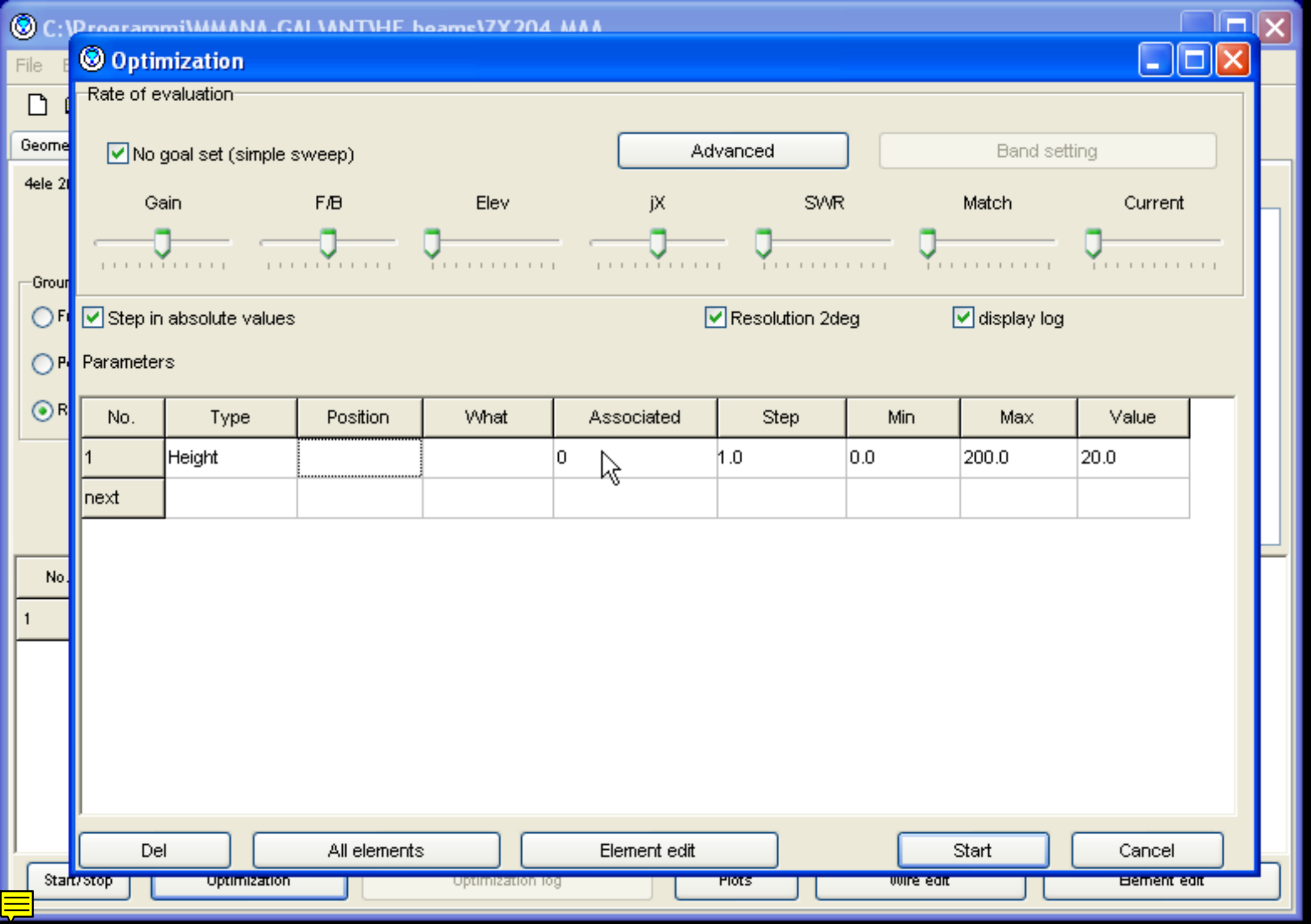
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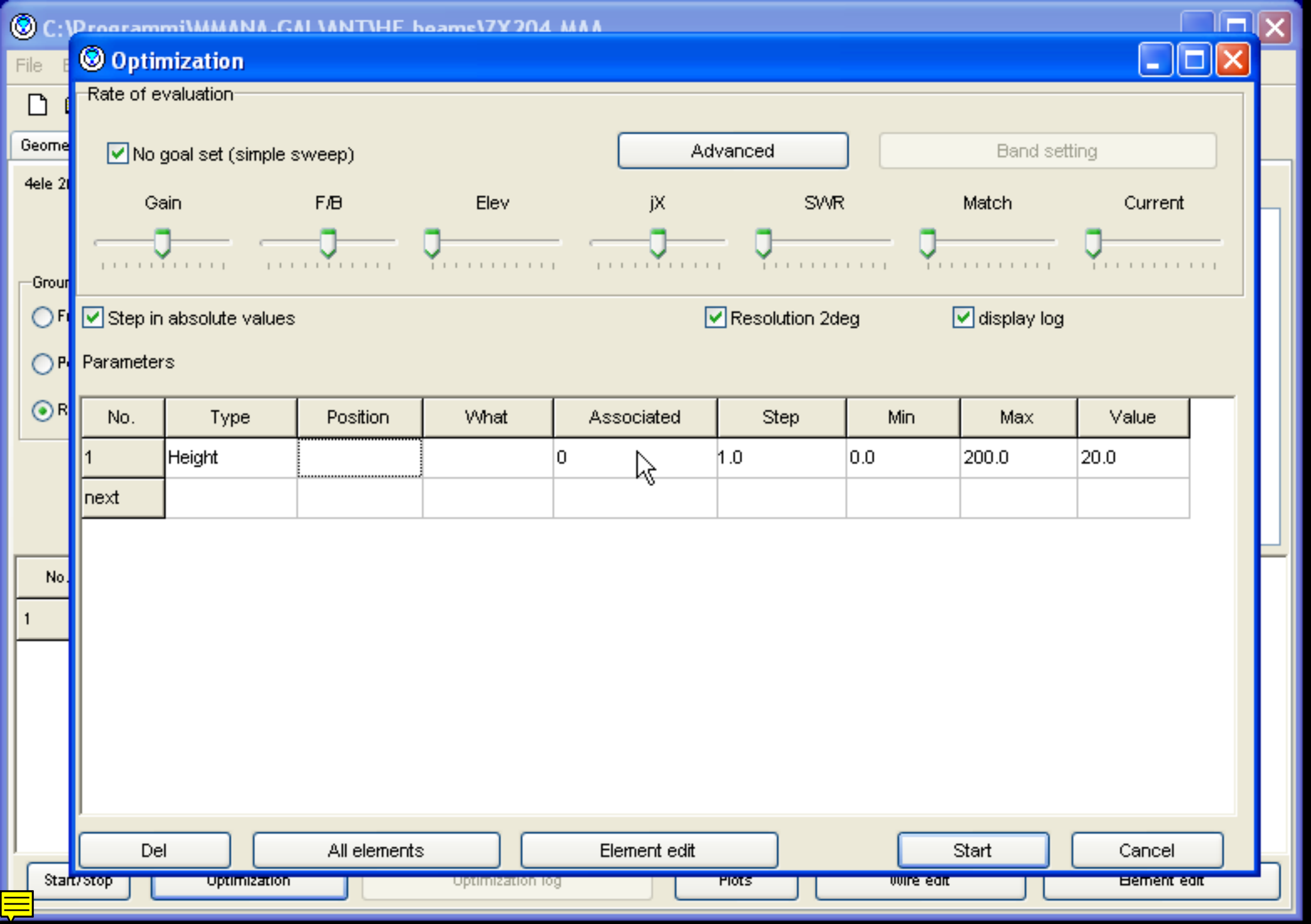
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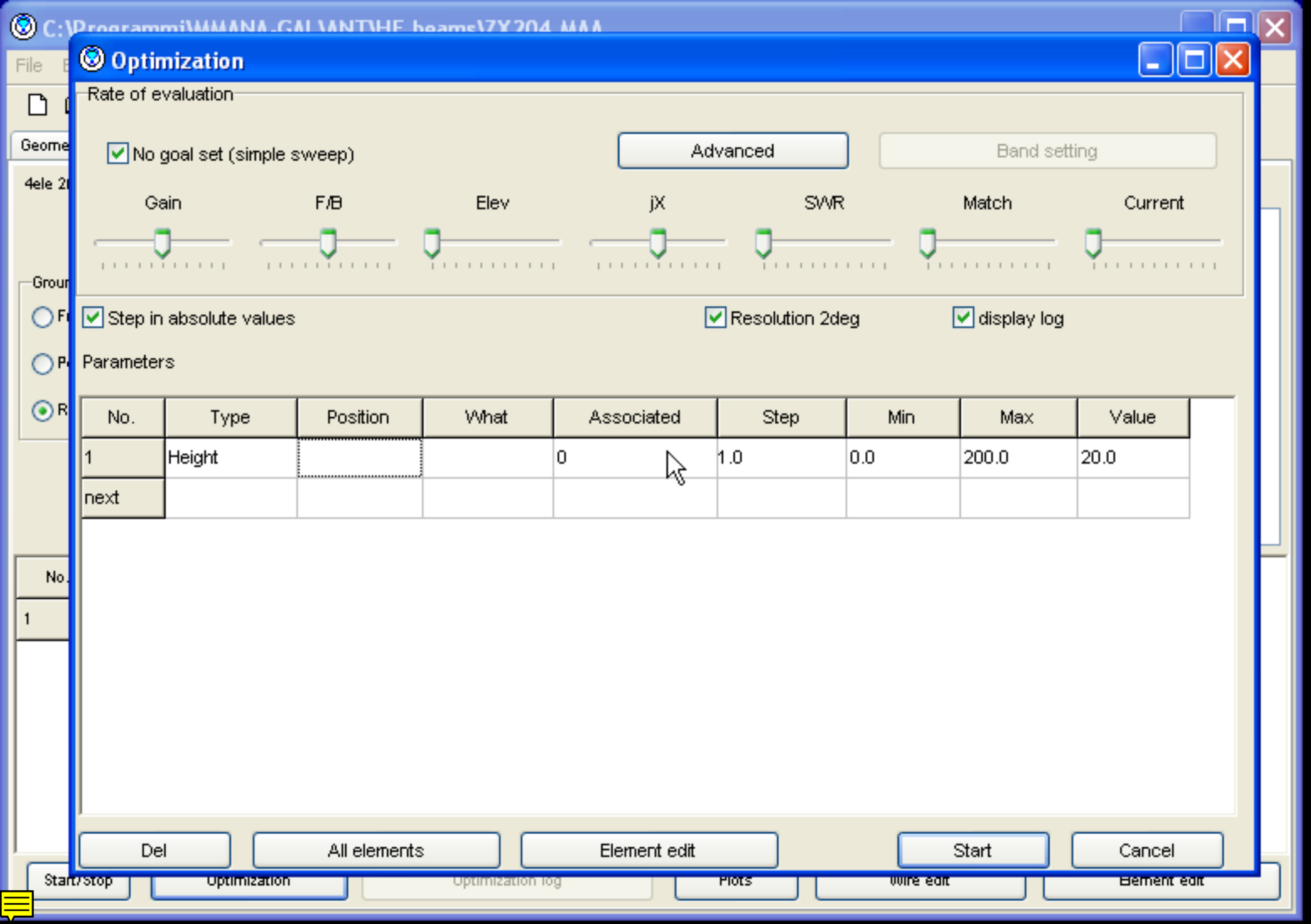
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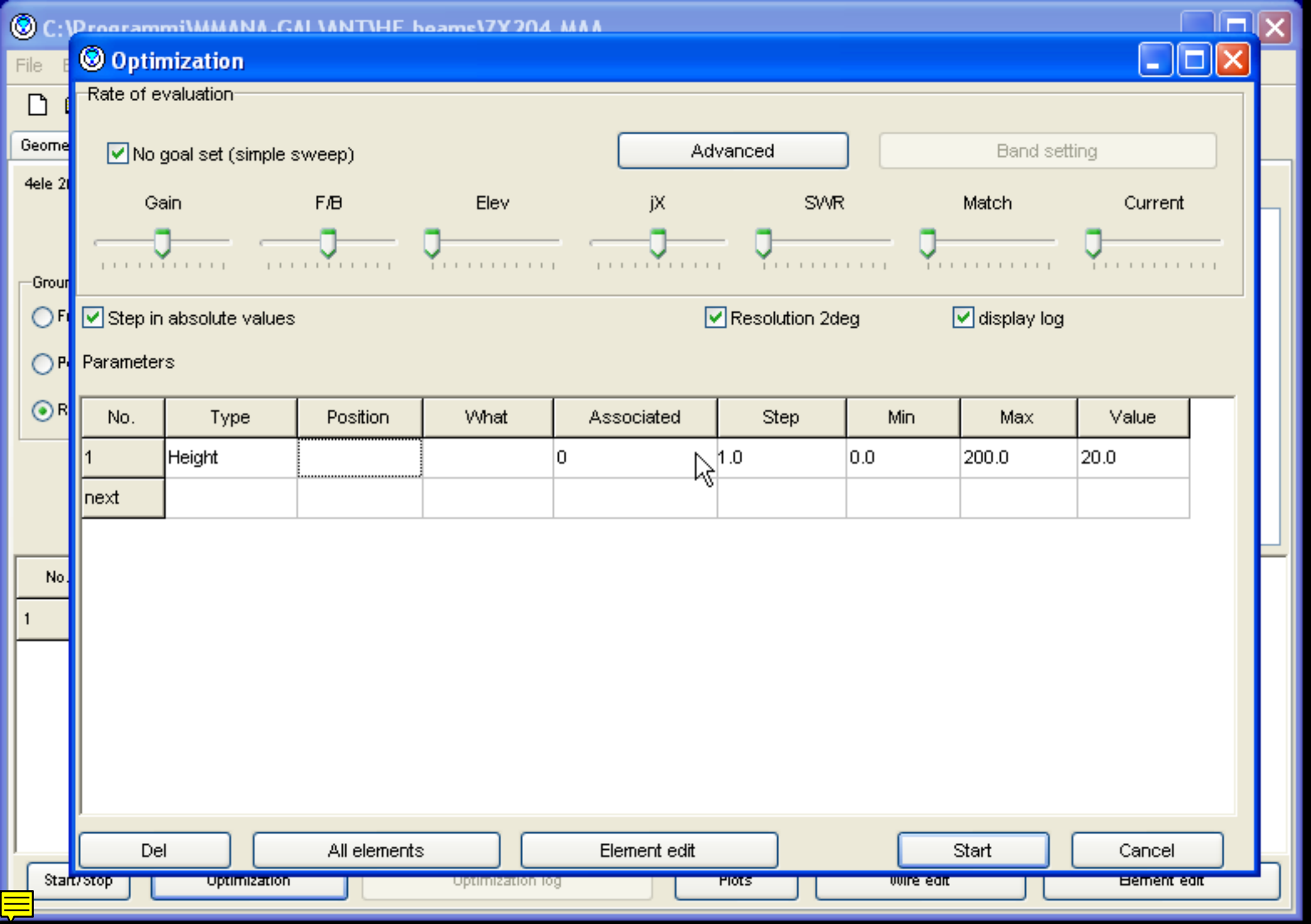
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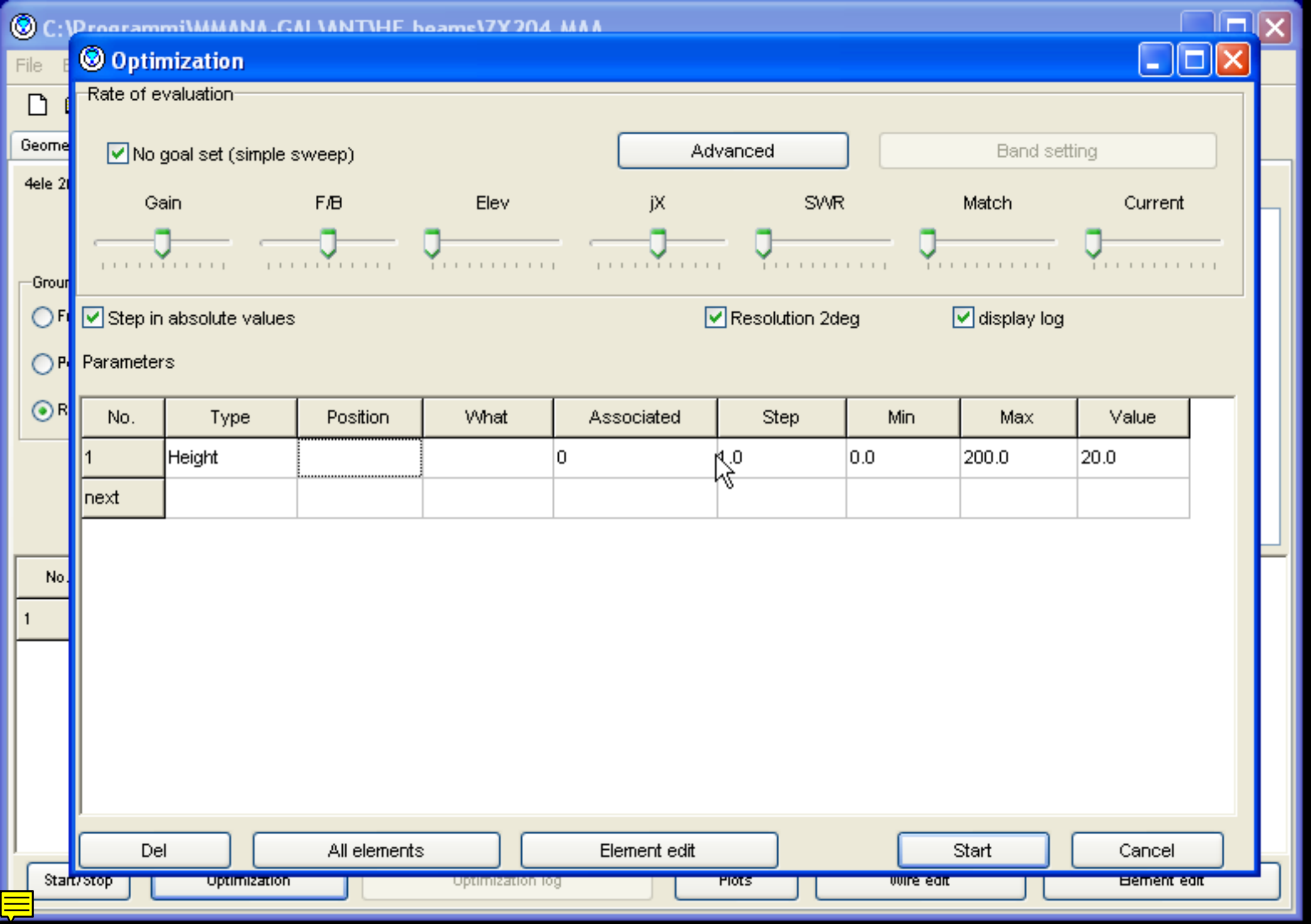
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
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Match
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Step in absolute values
Resolution 2deg
display log
Parameters
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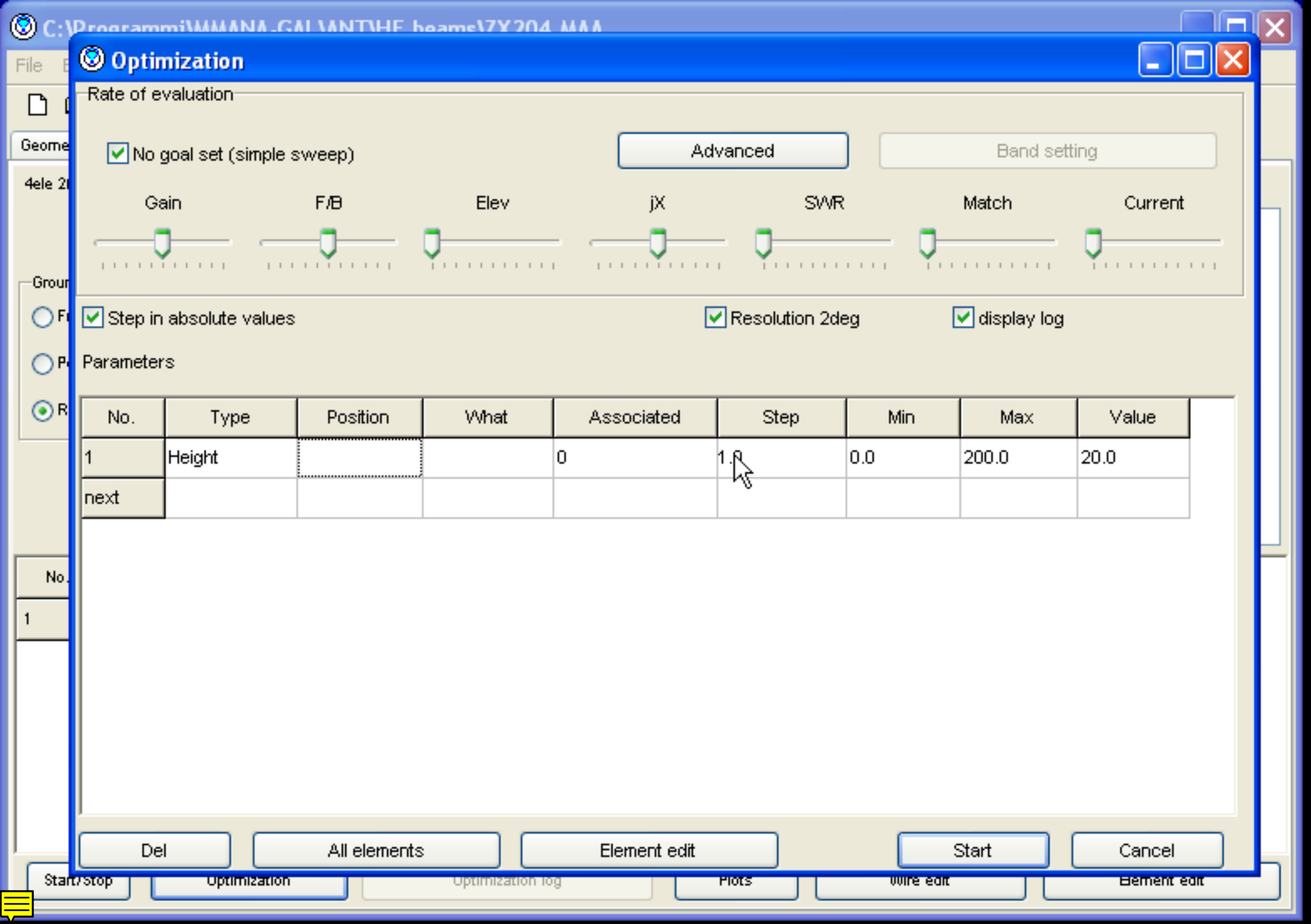
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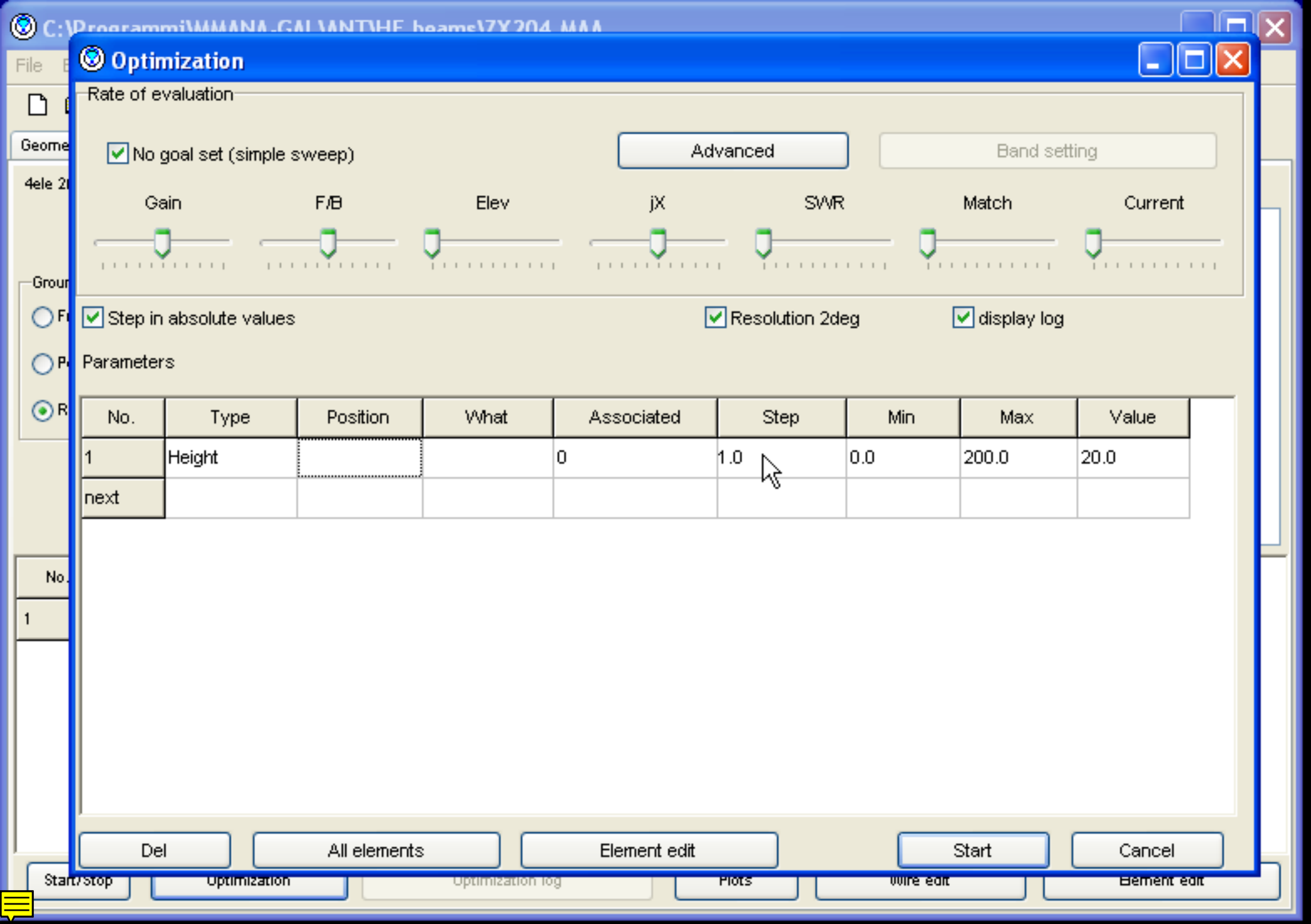
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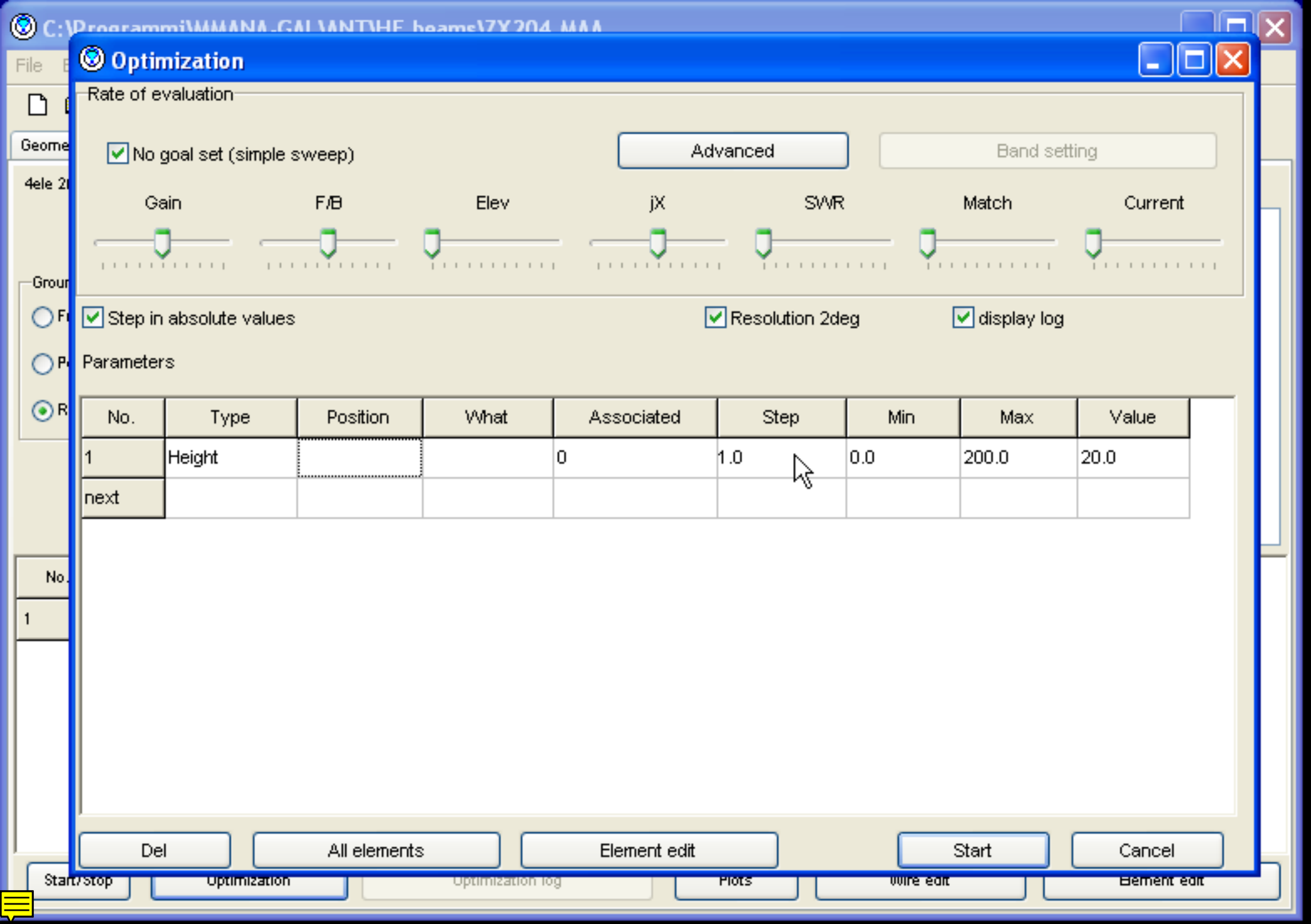
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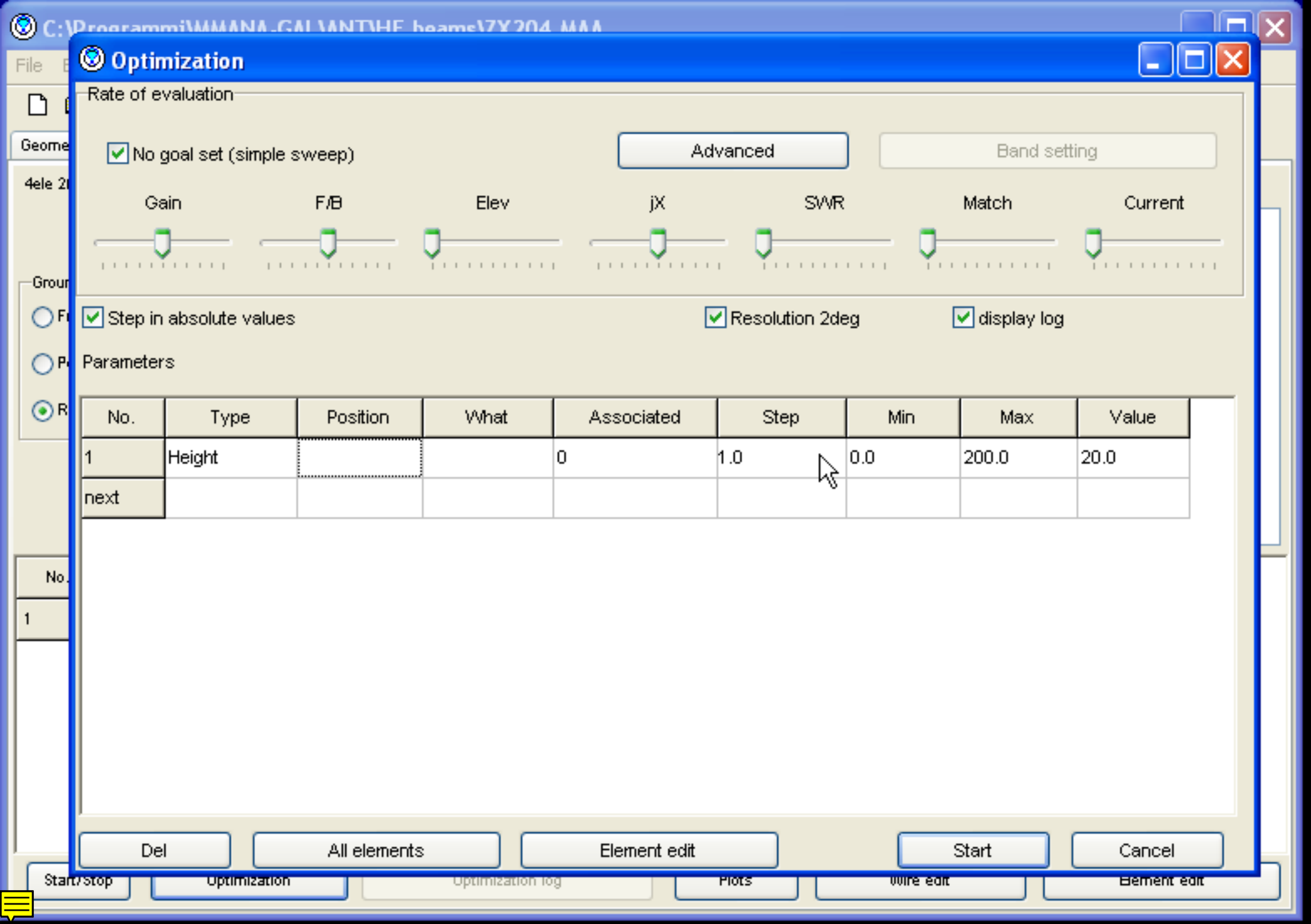
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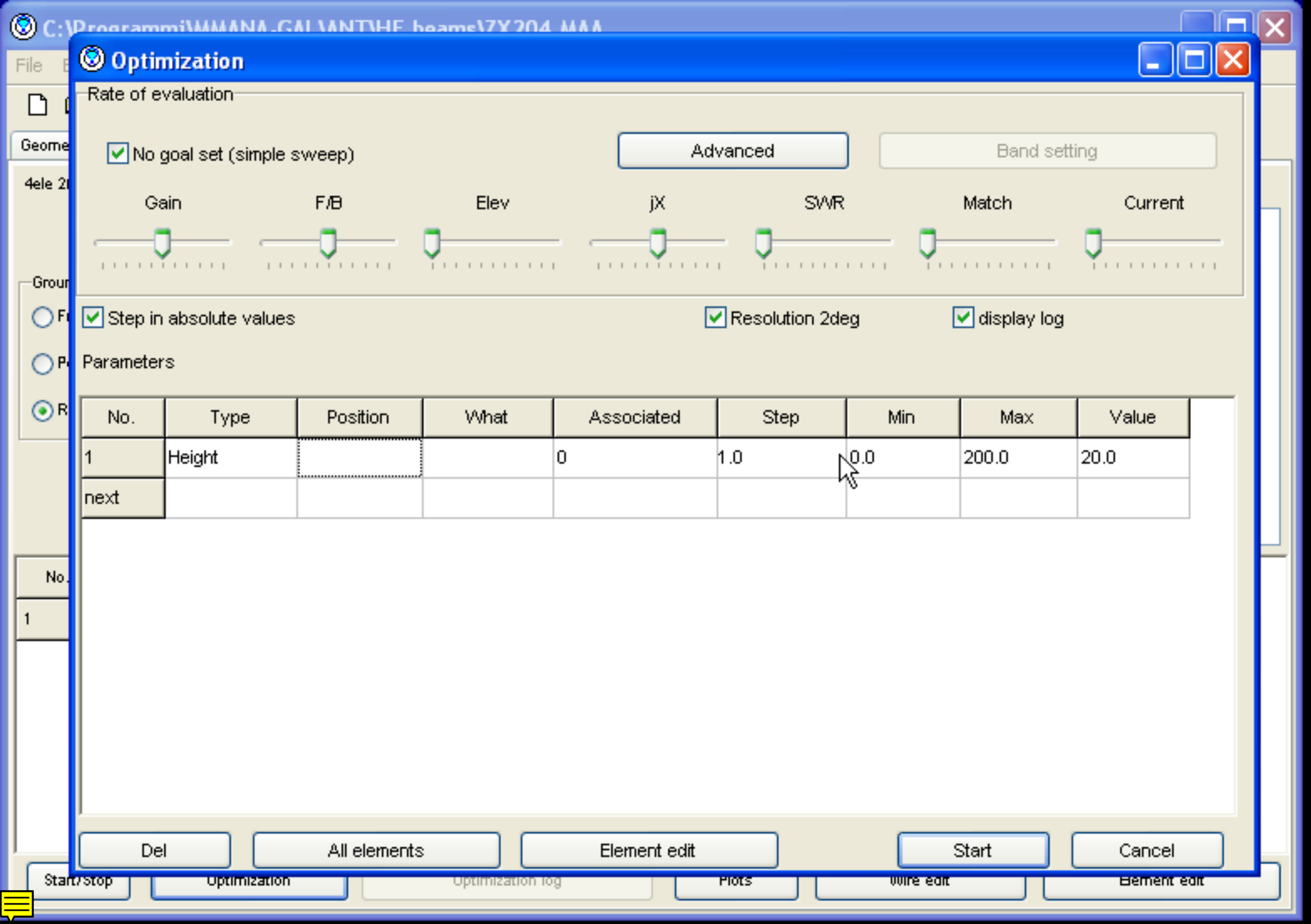
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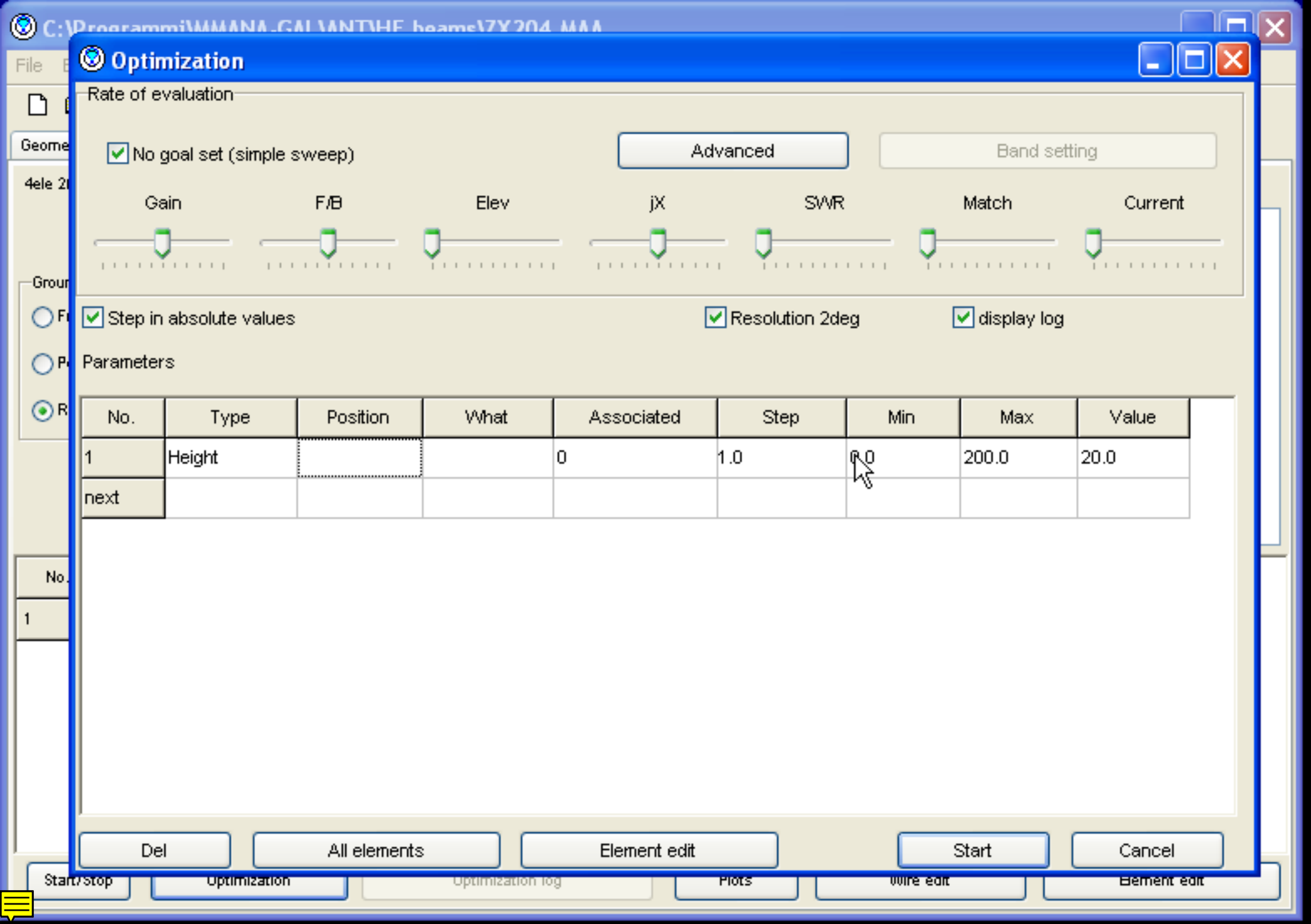
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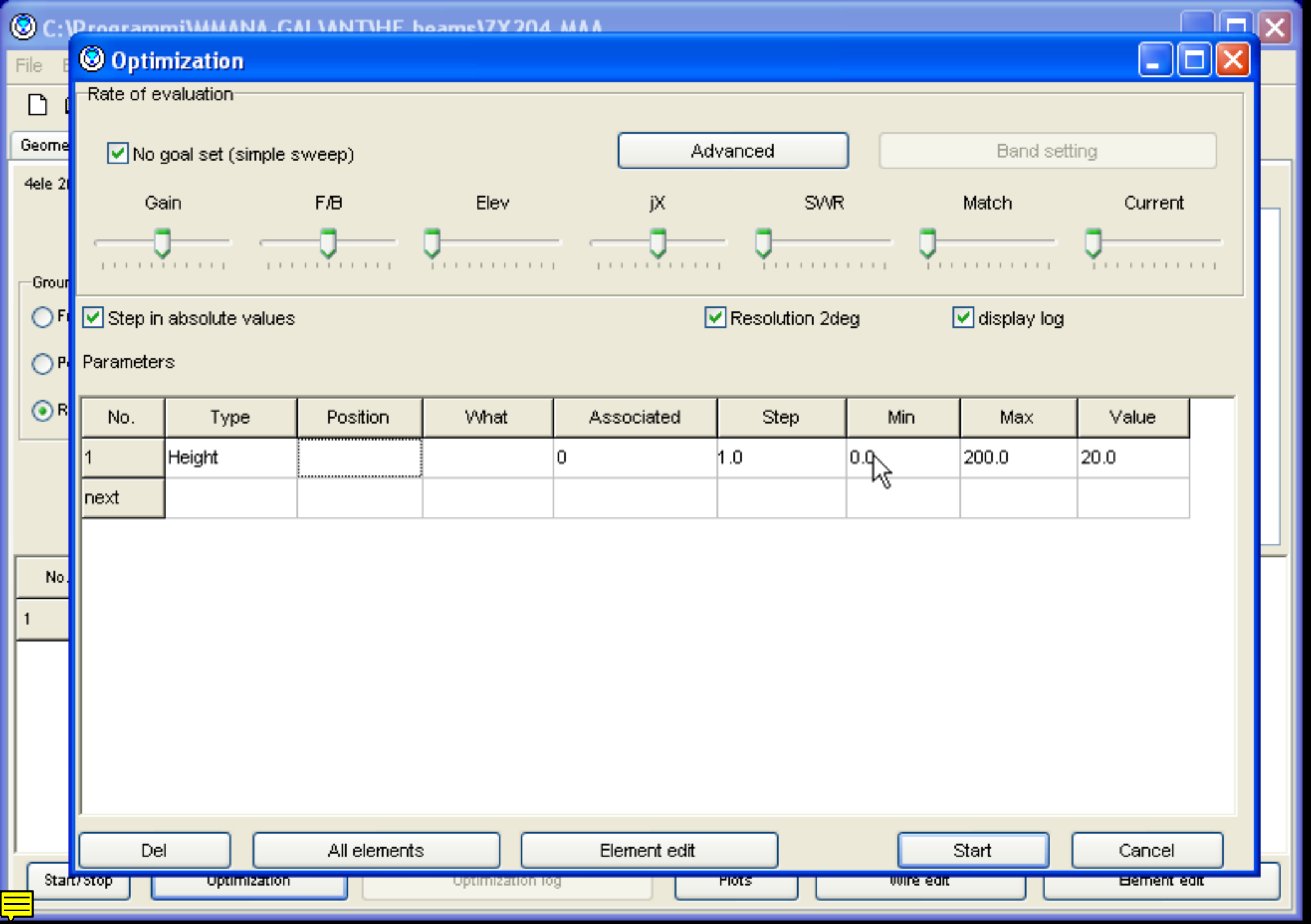
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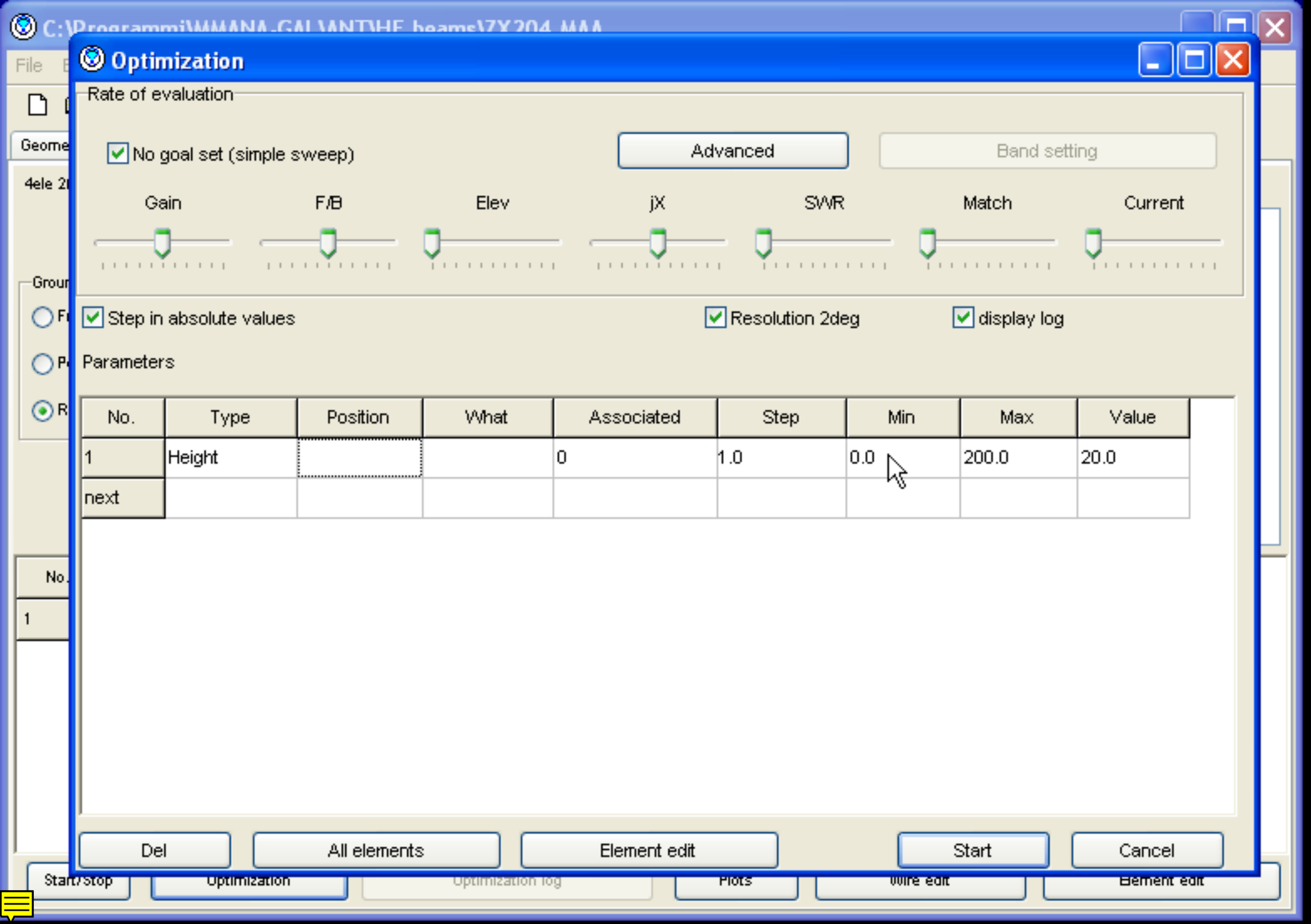
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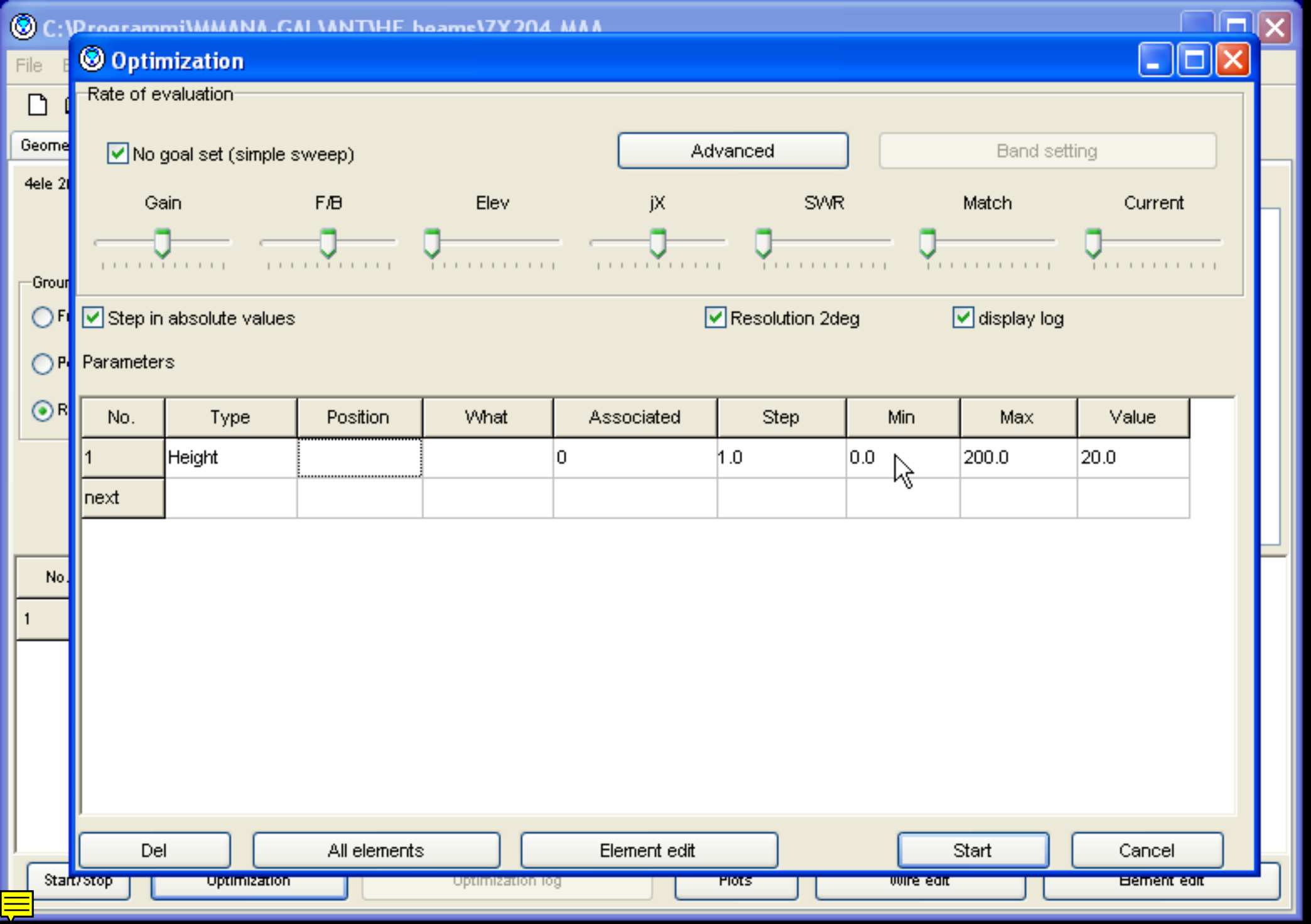
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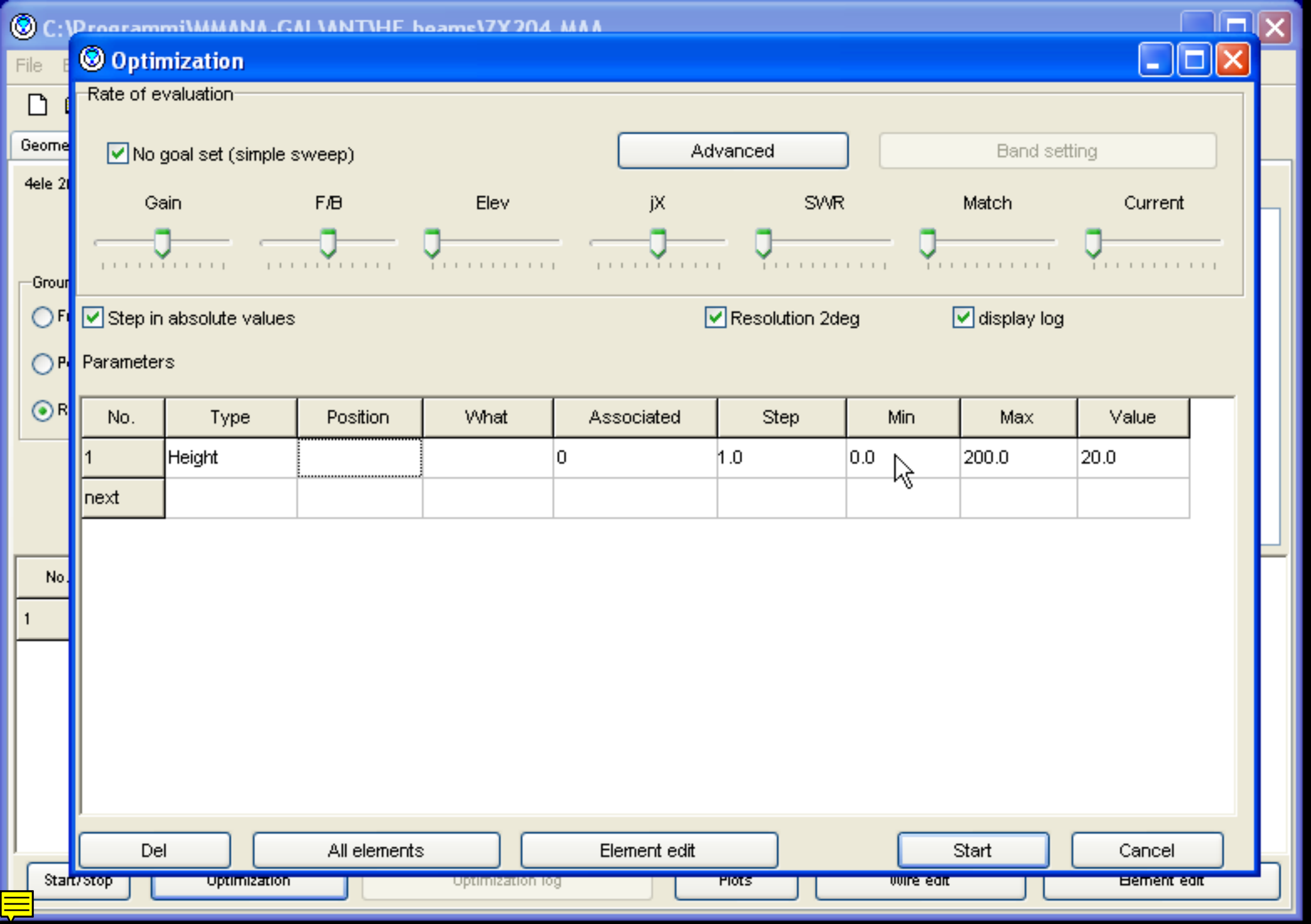
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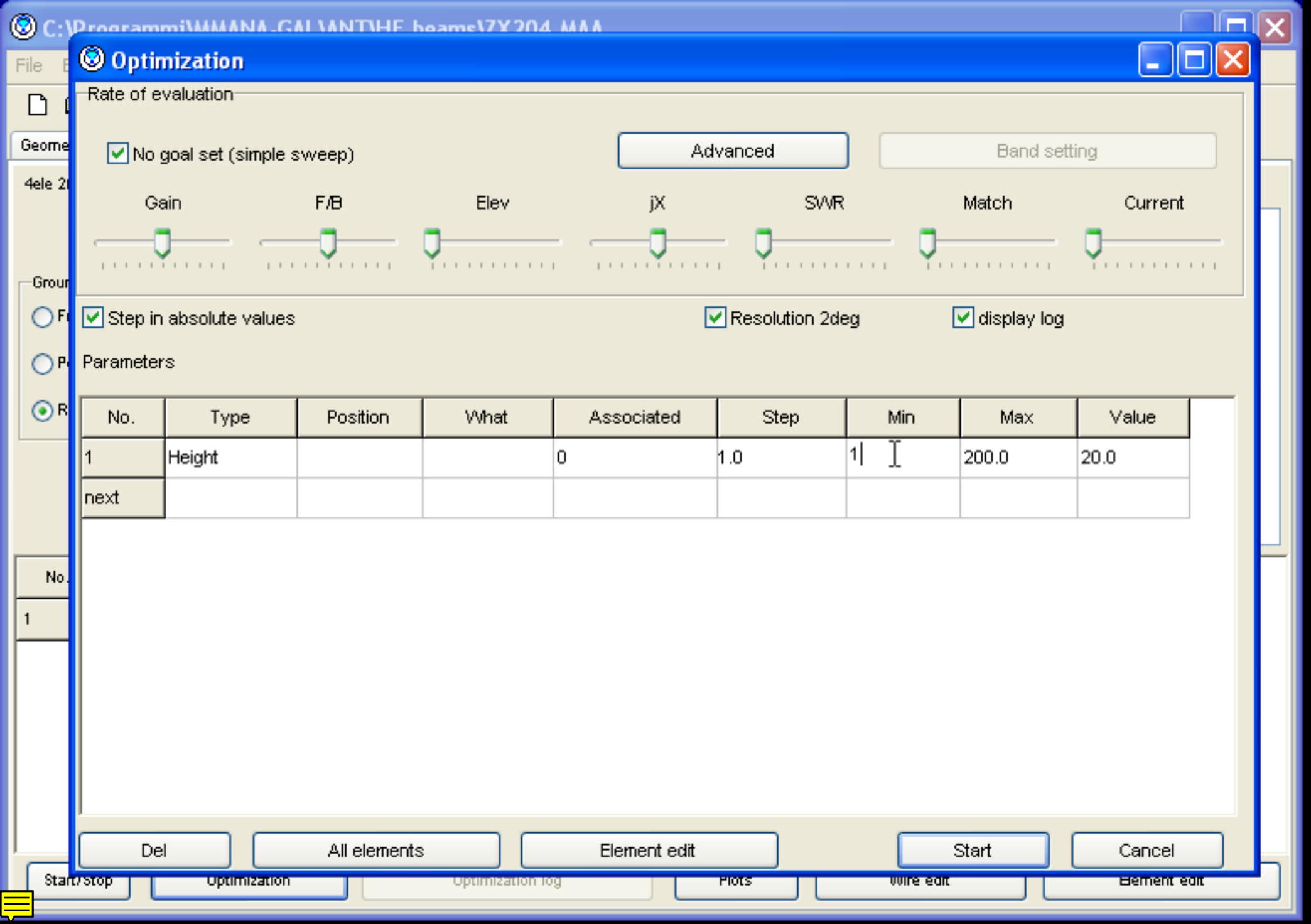
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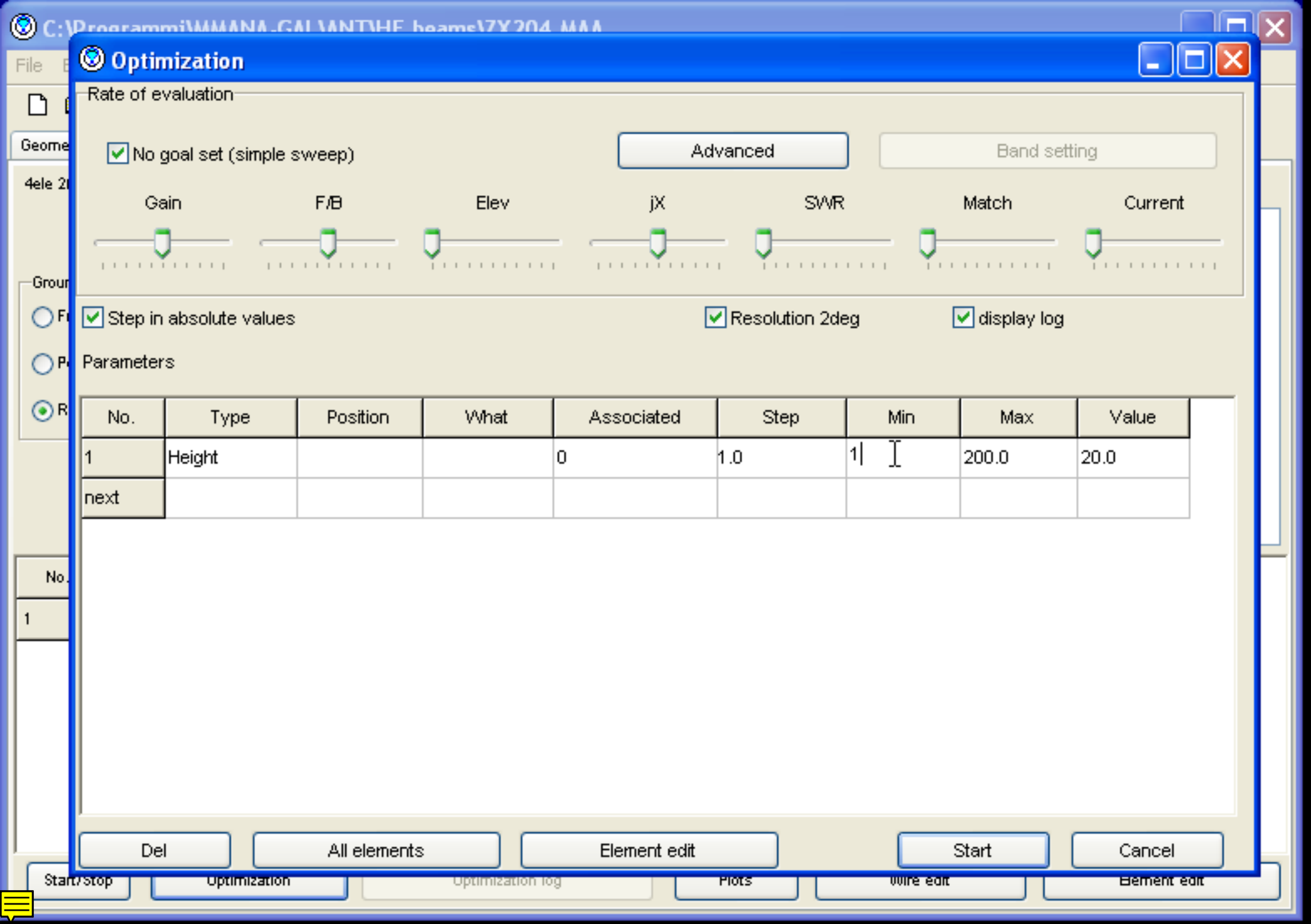
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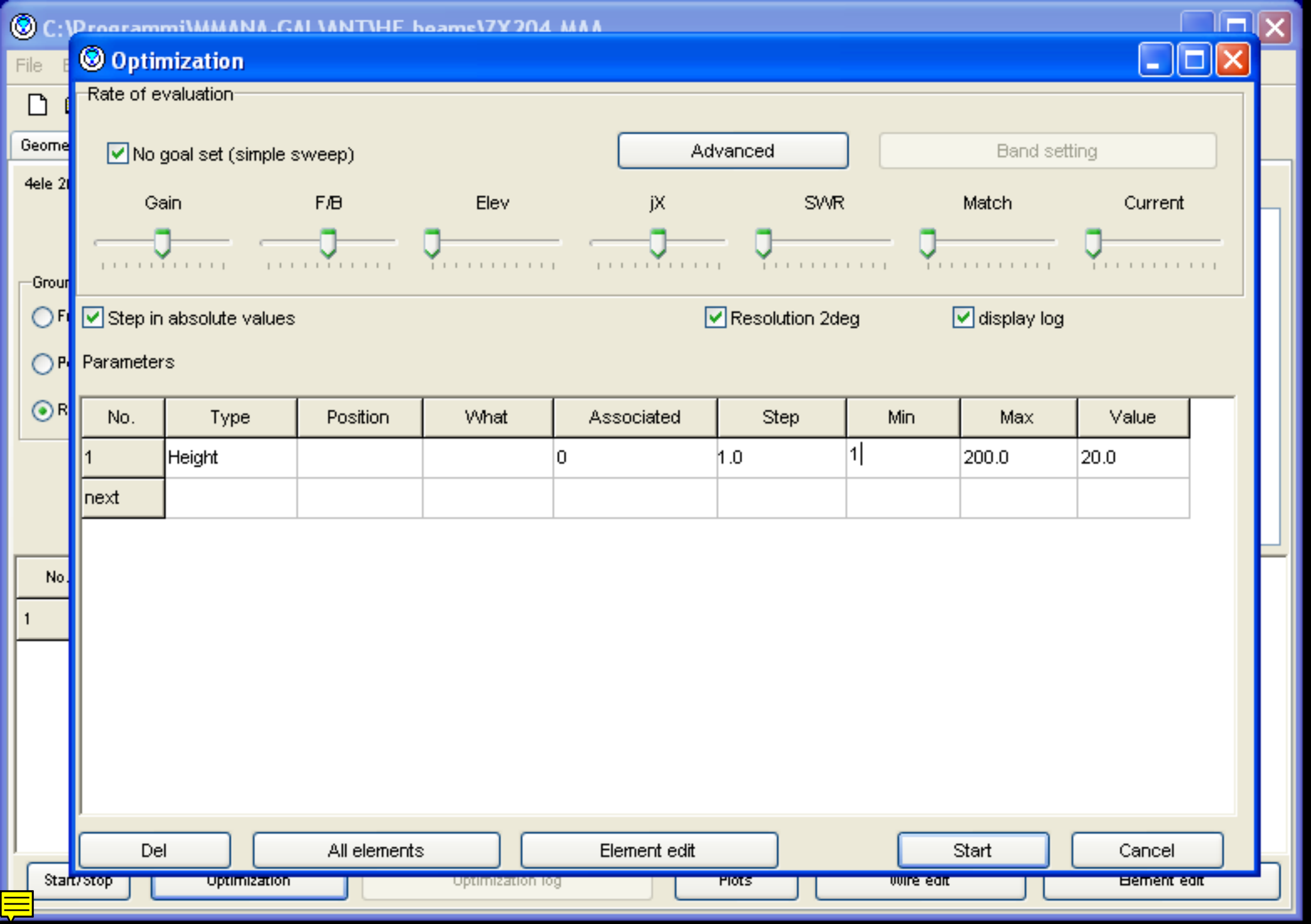
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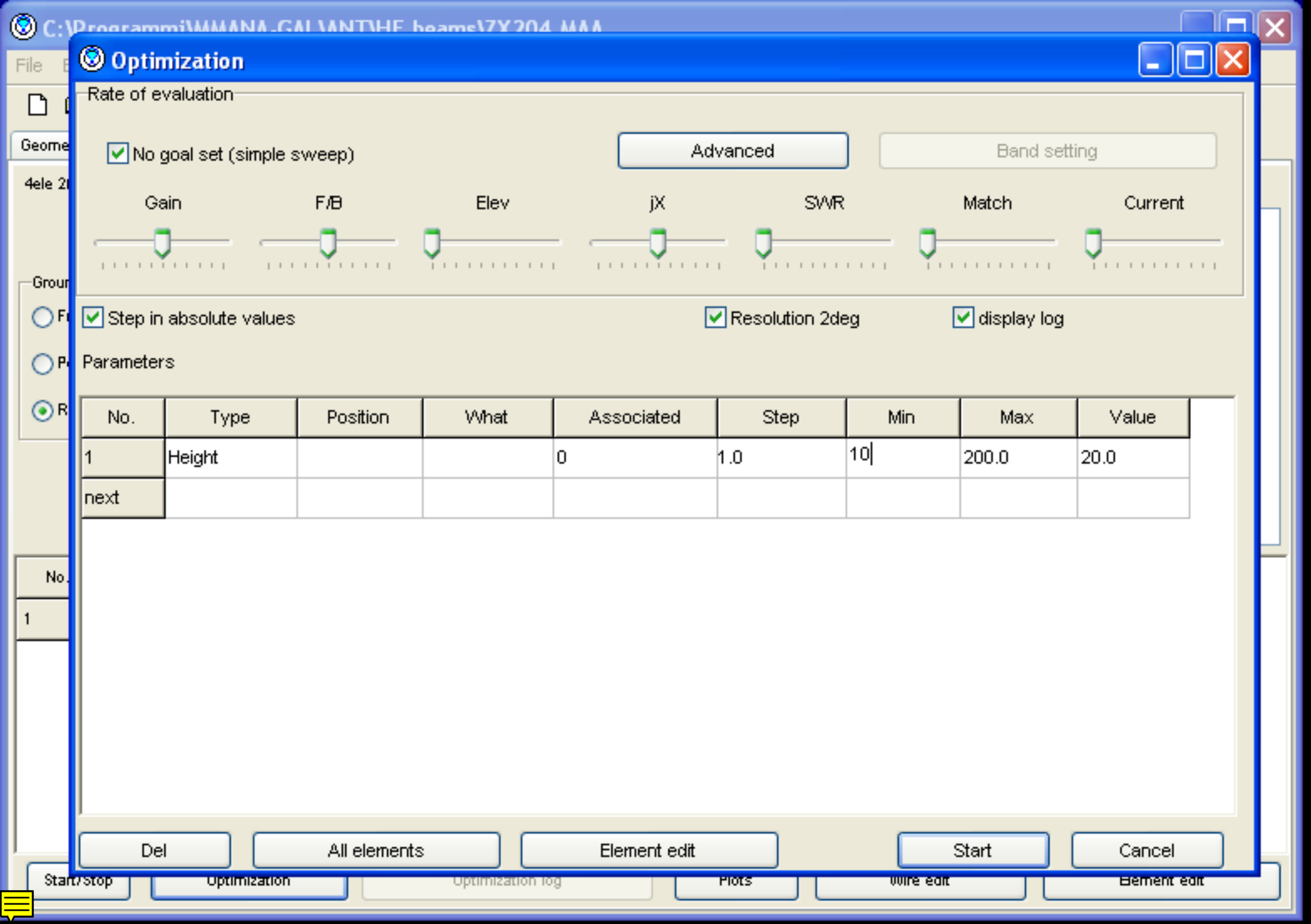
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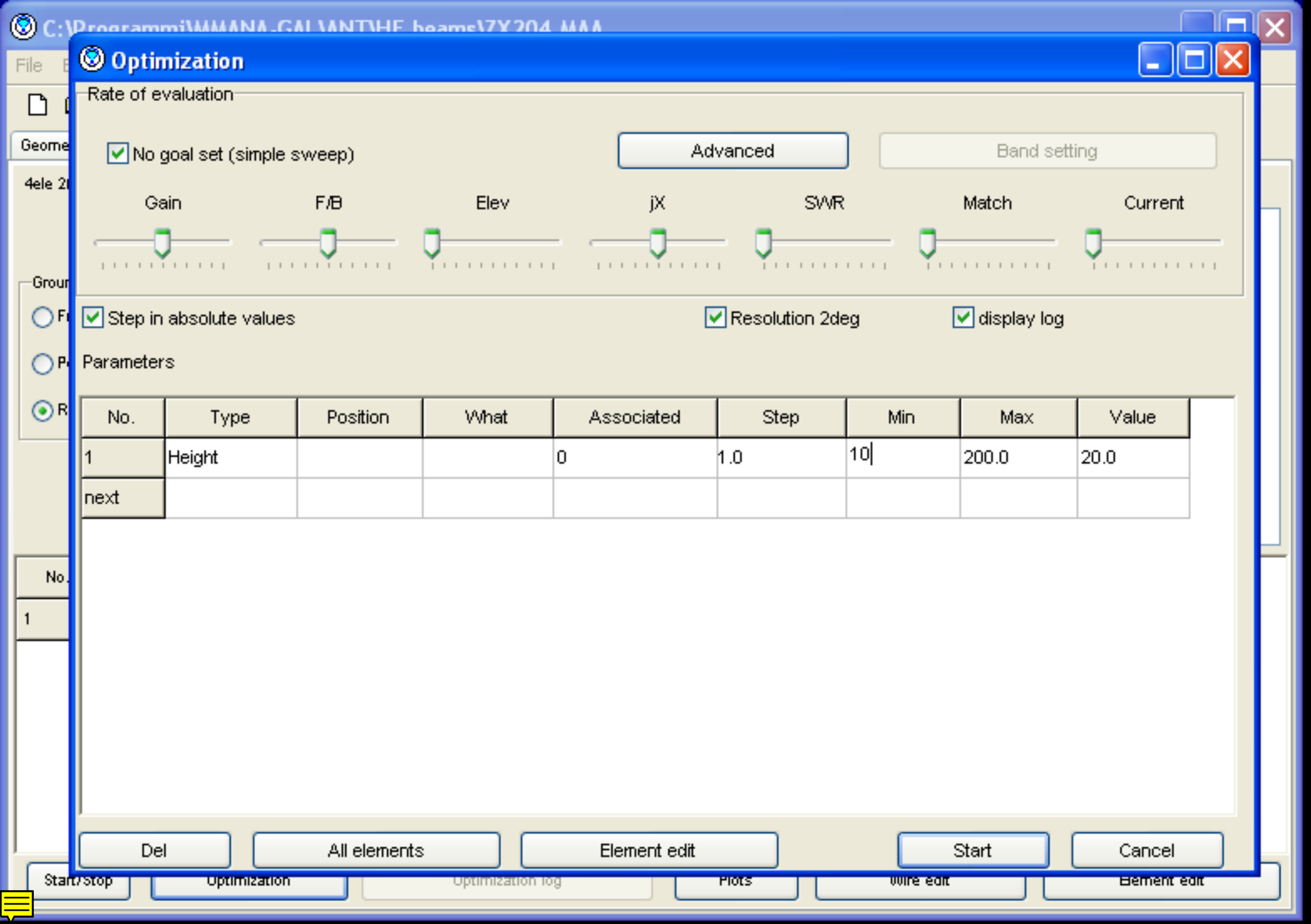
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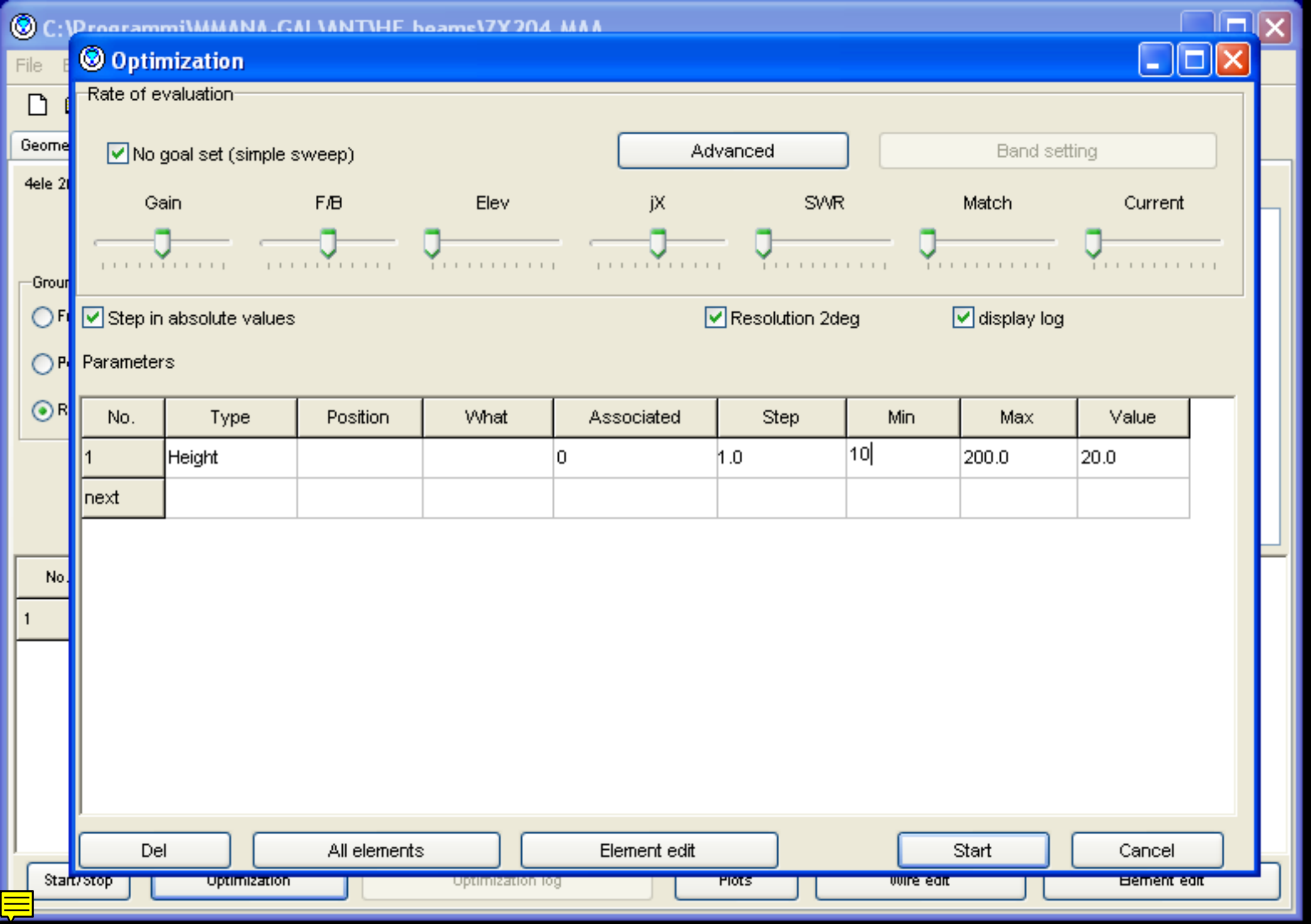
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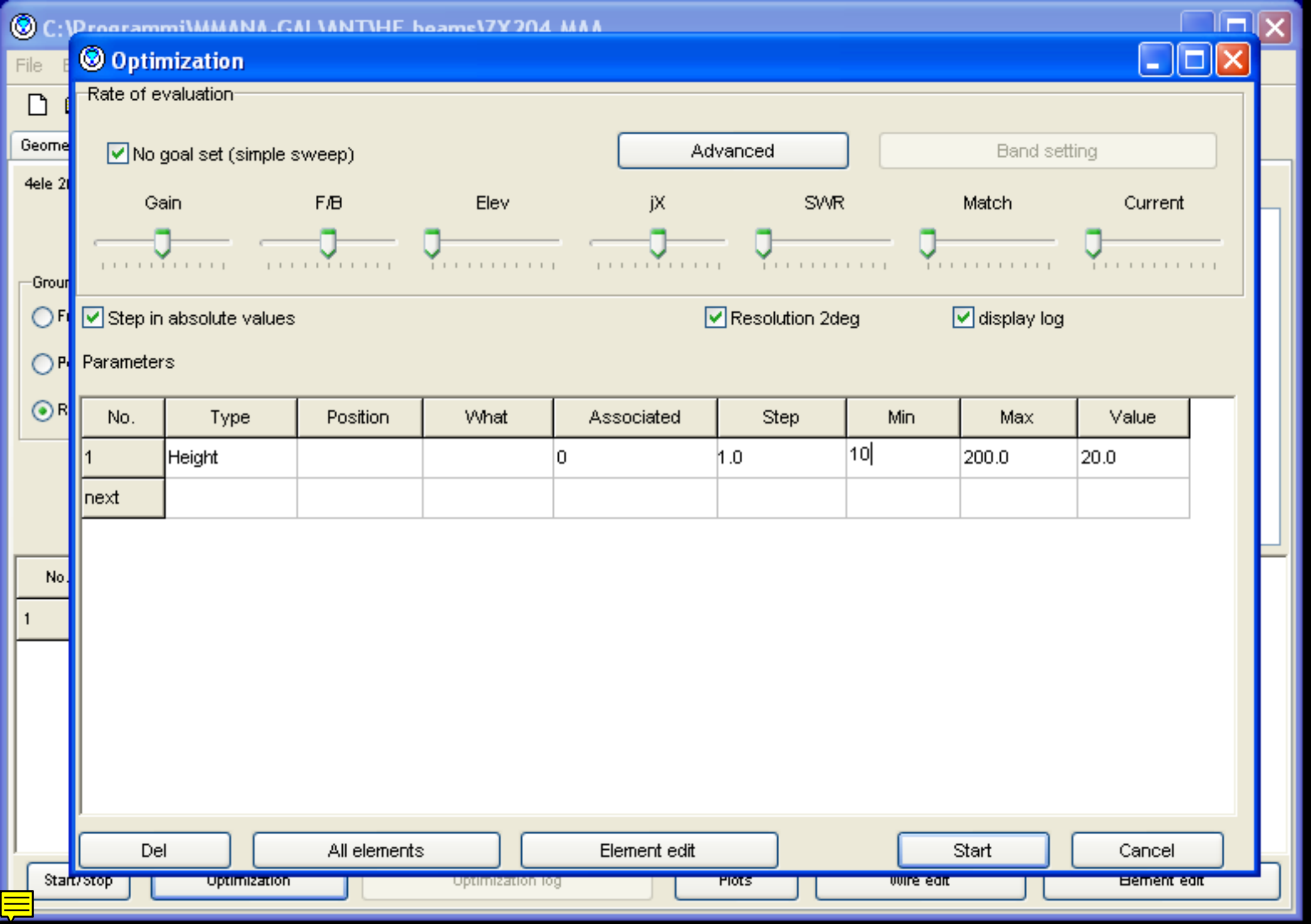
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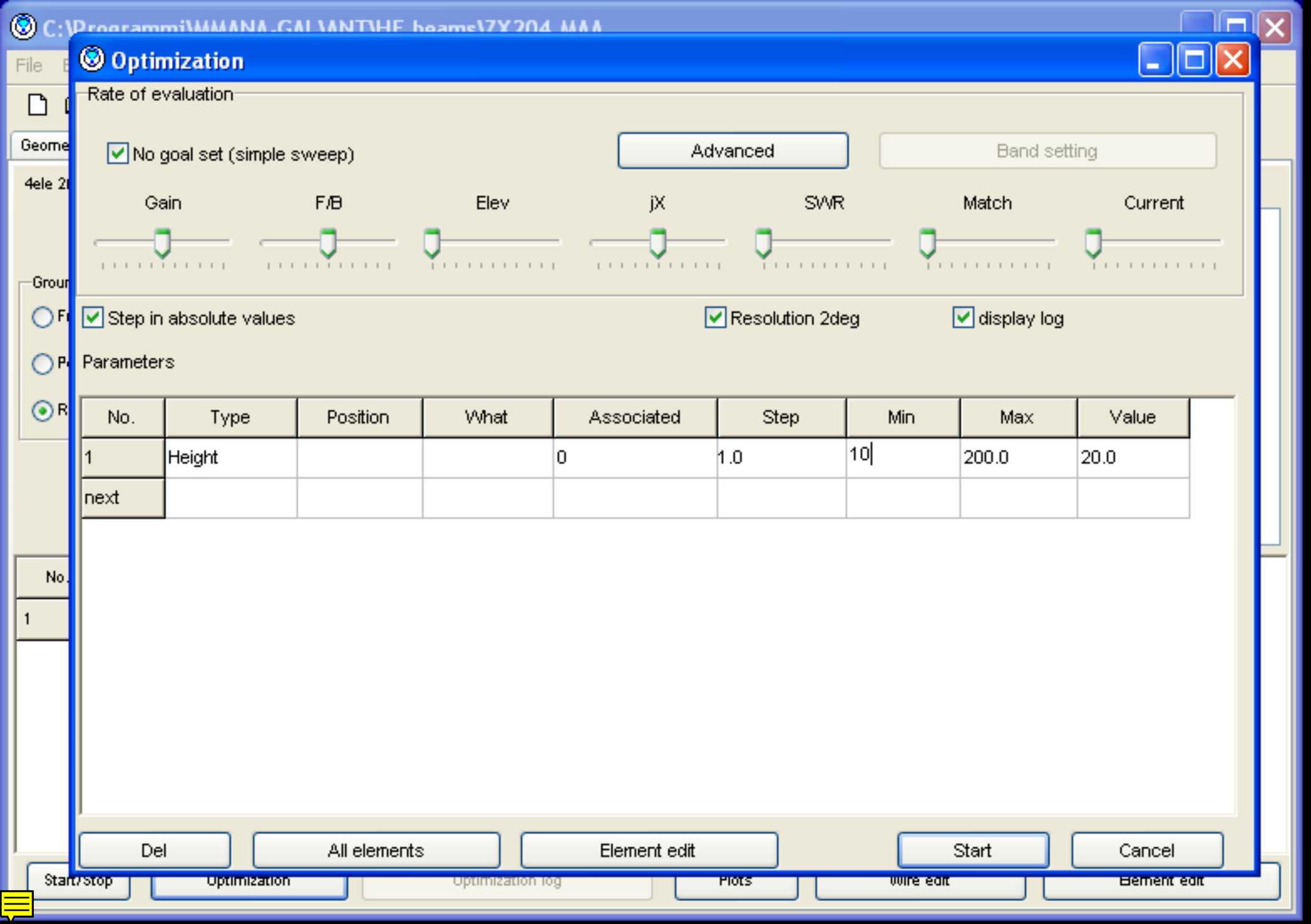
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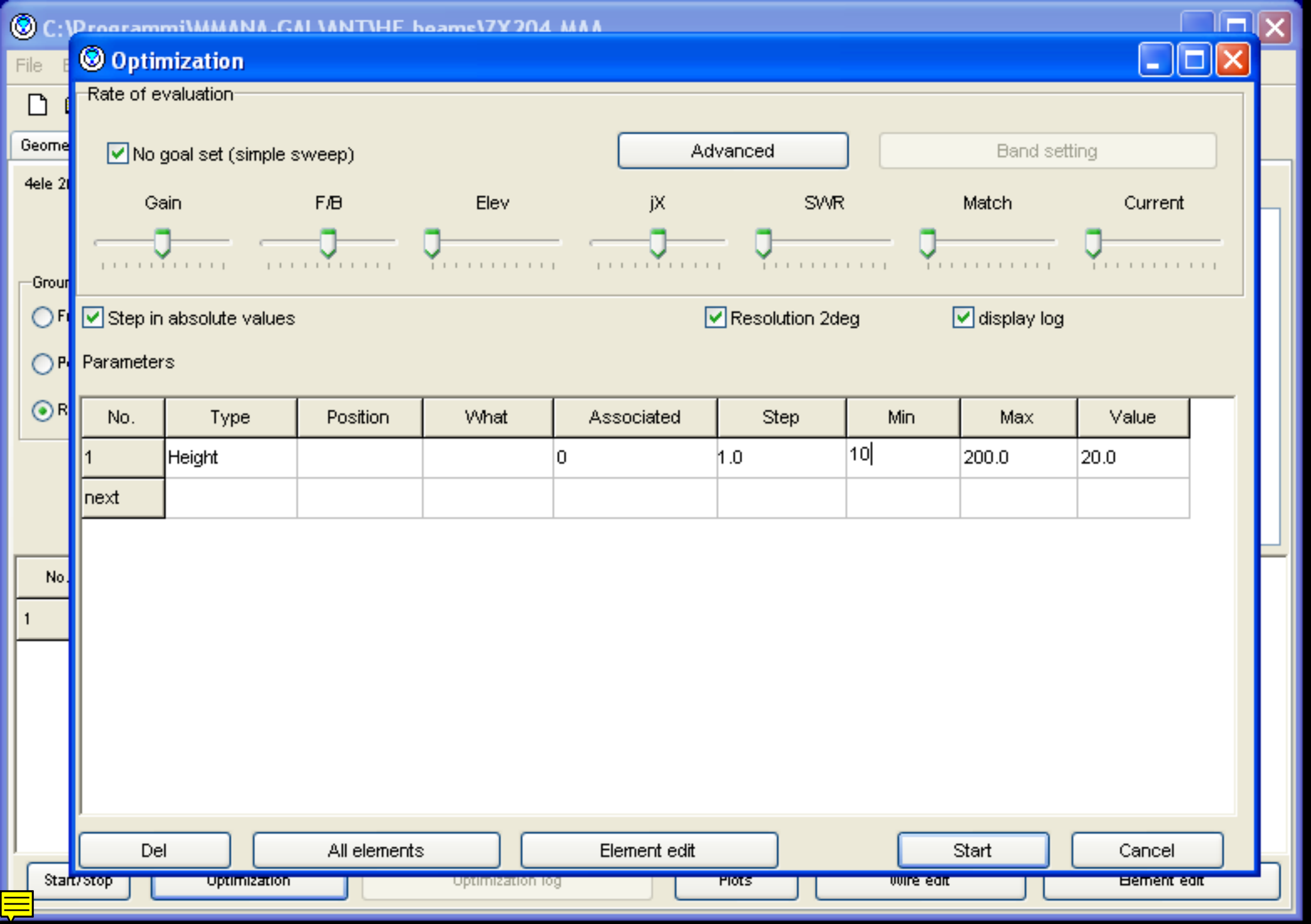
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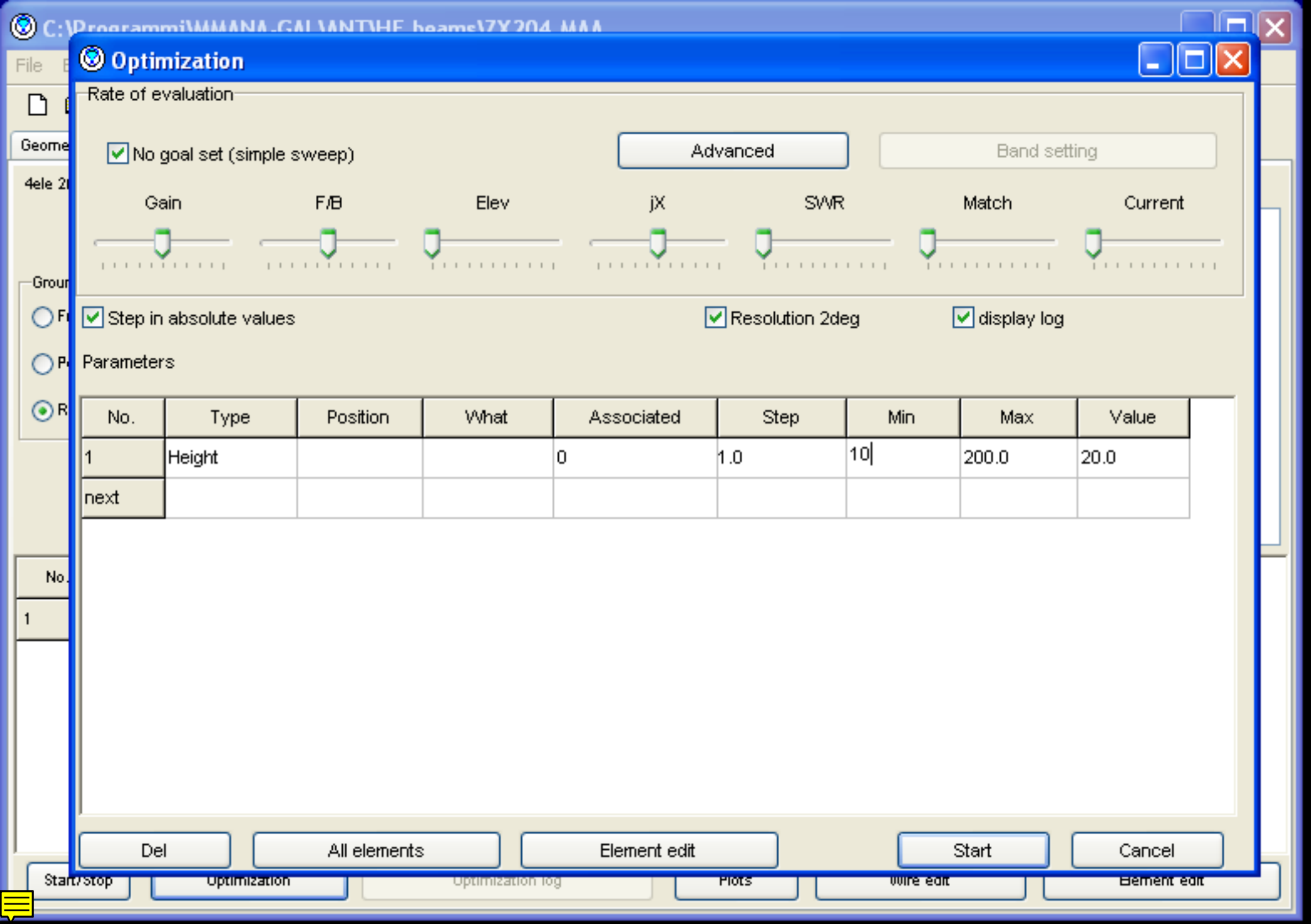
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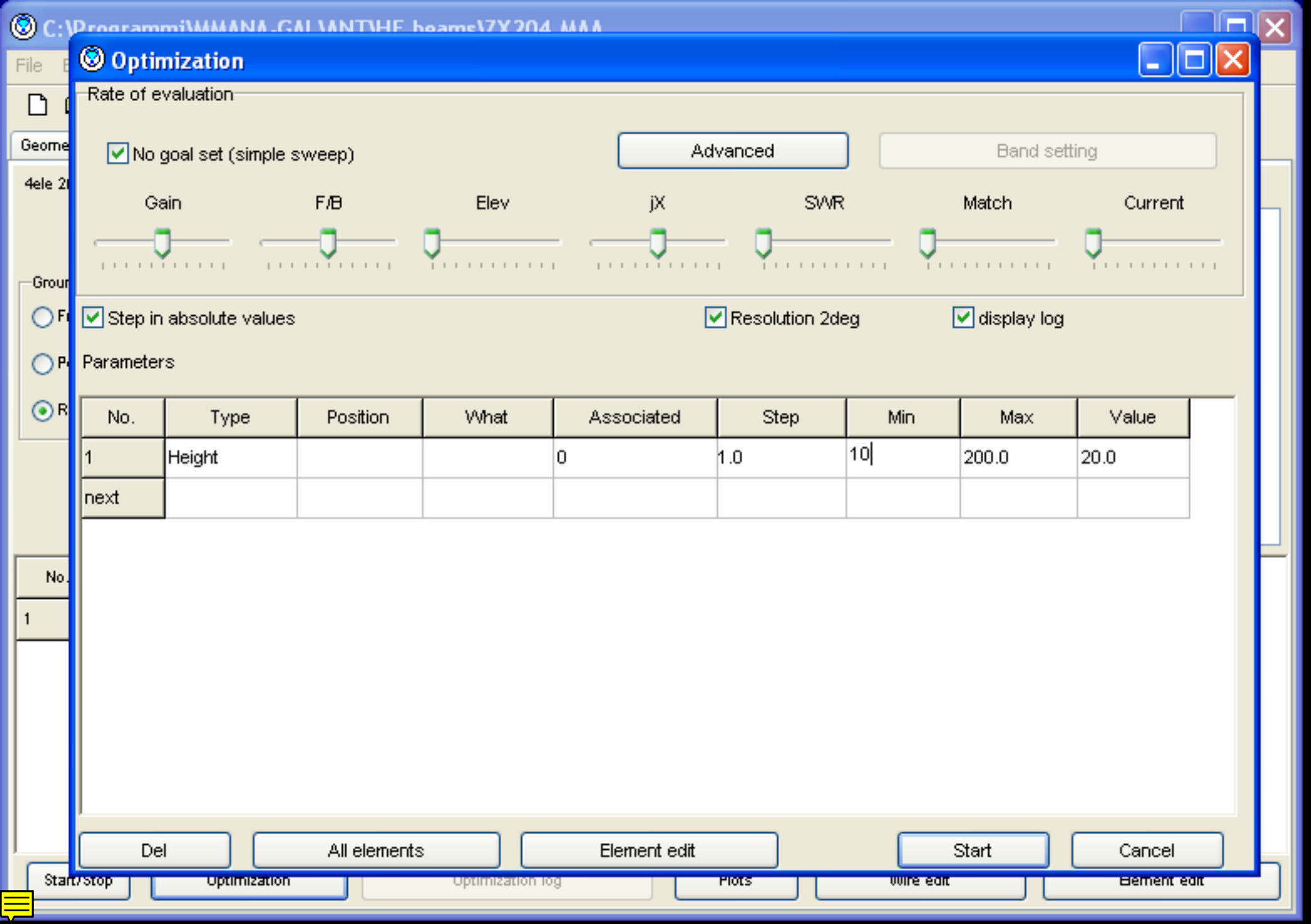
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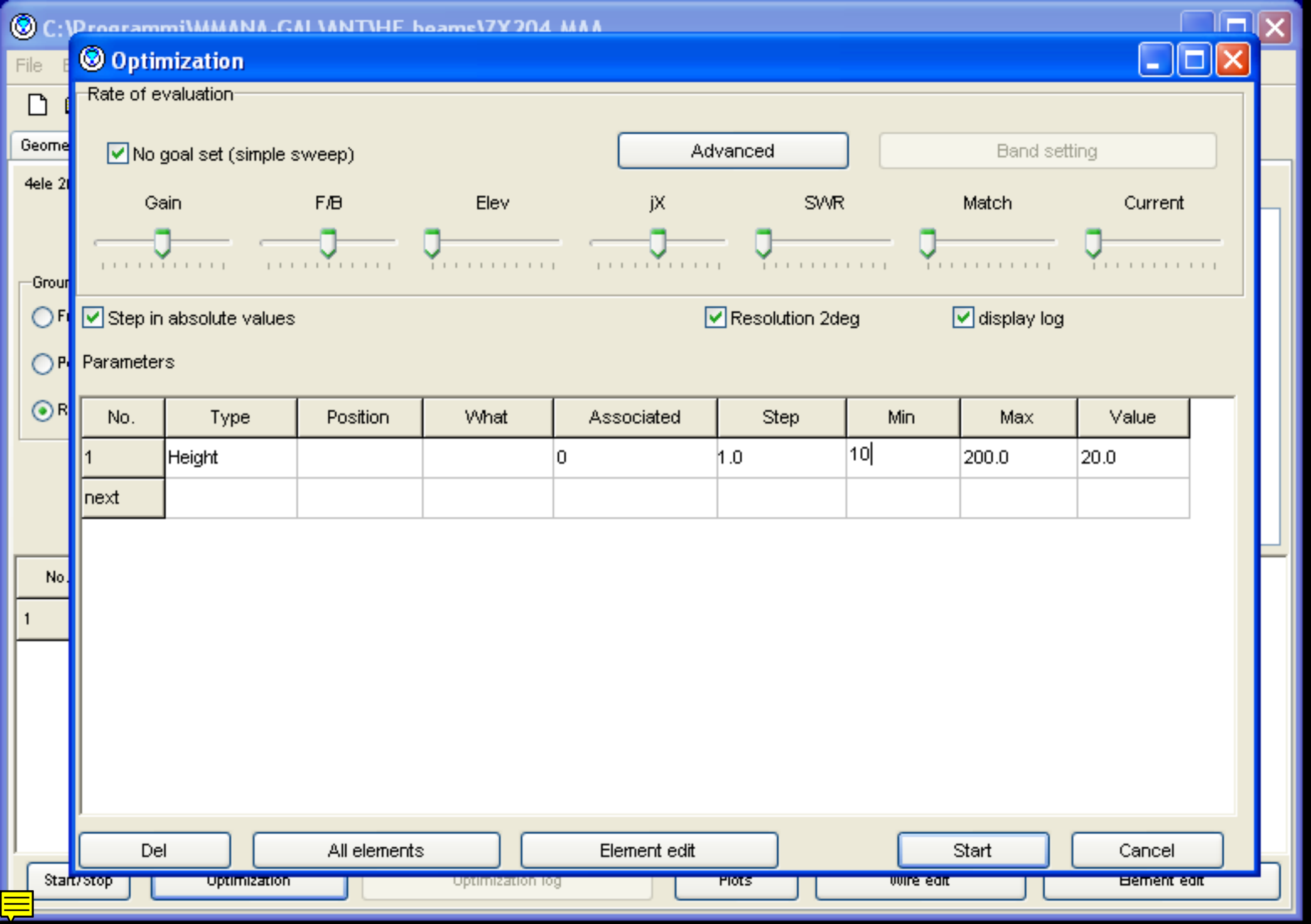
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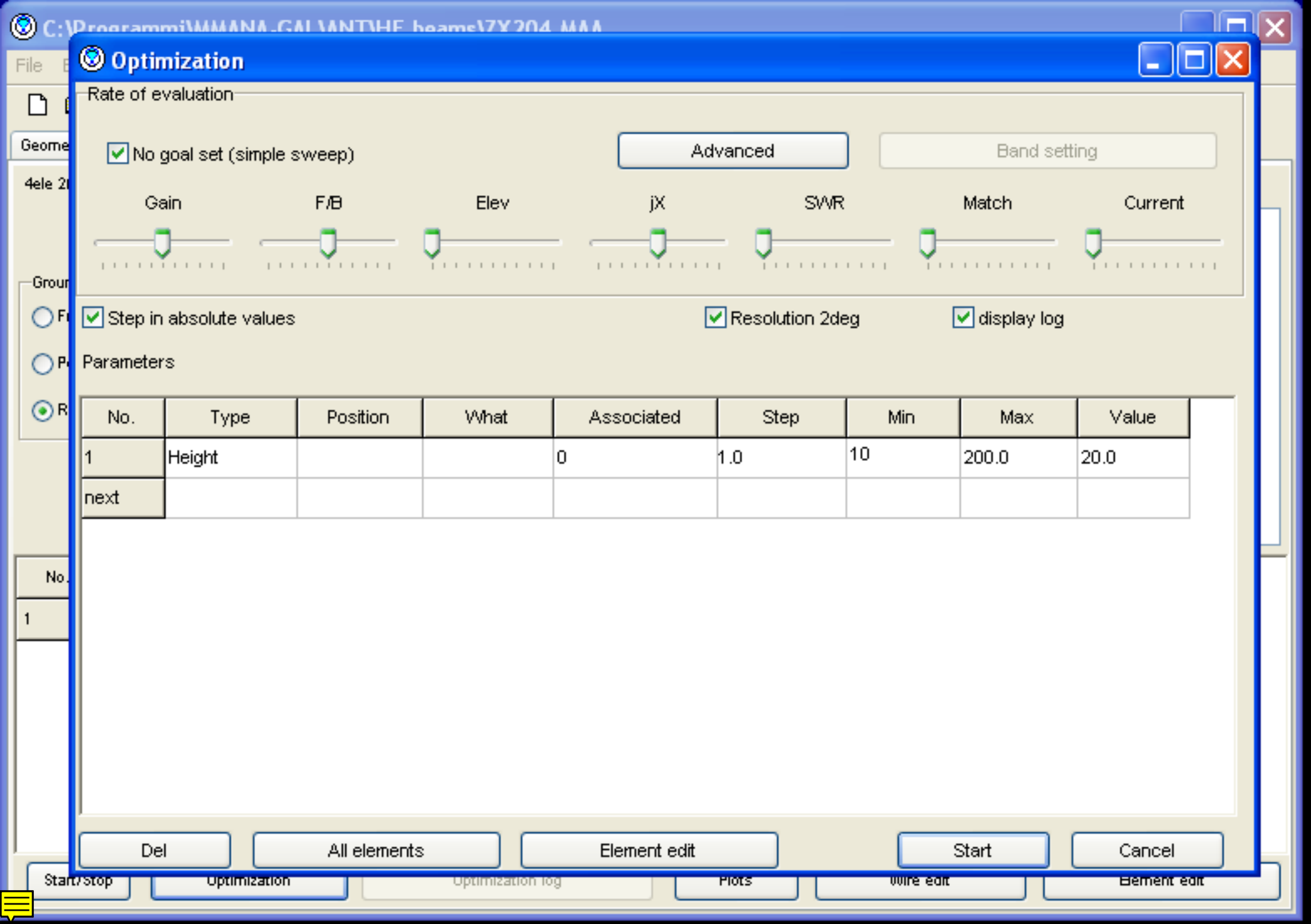
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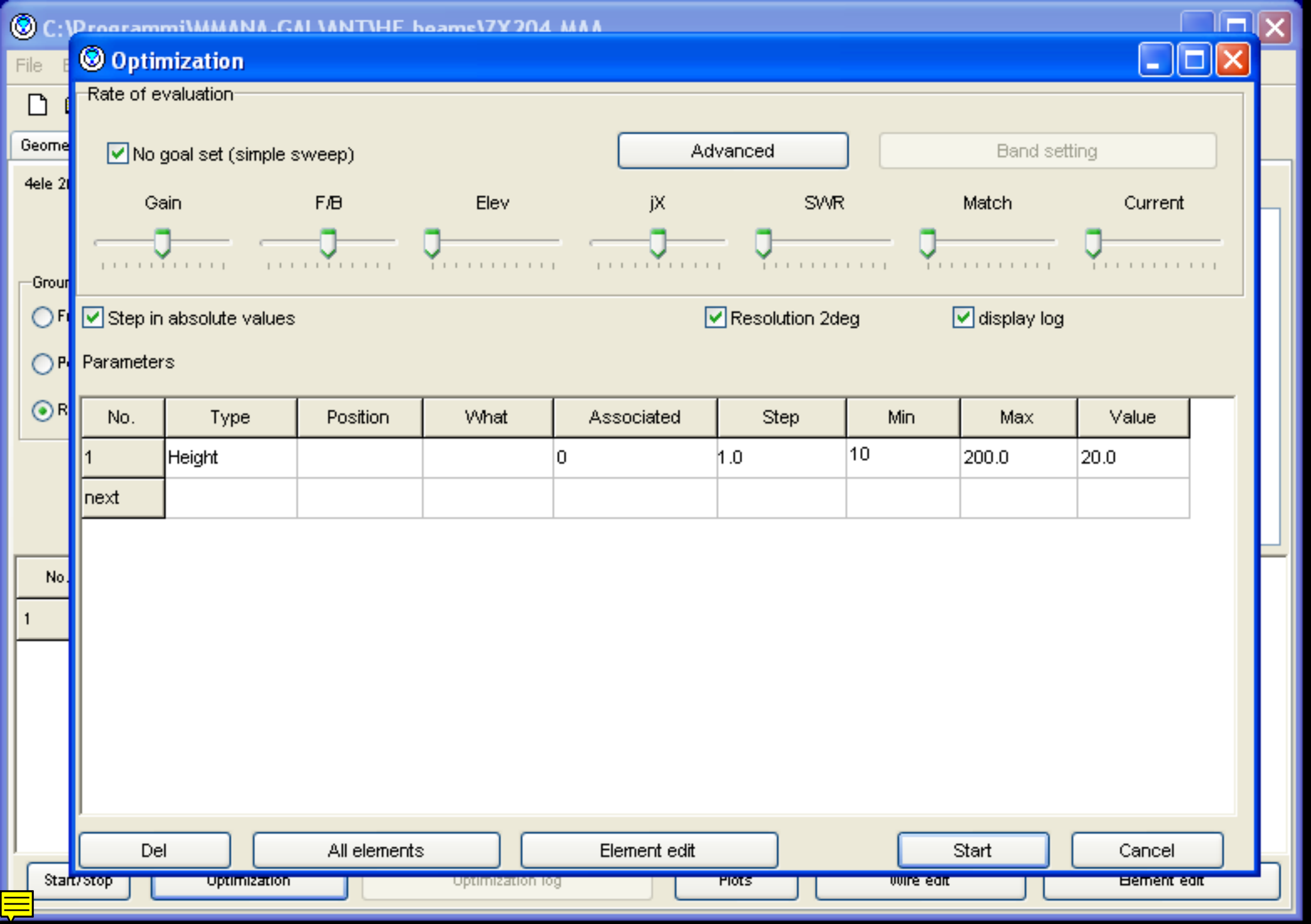
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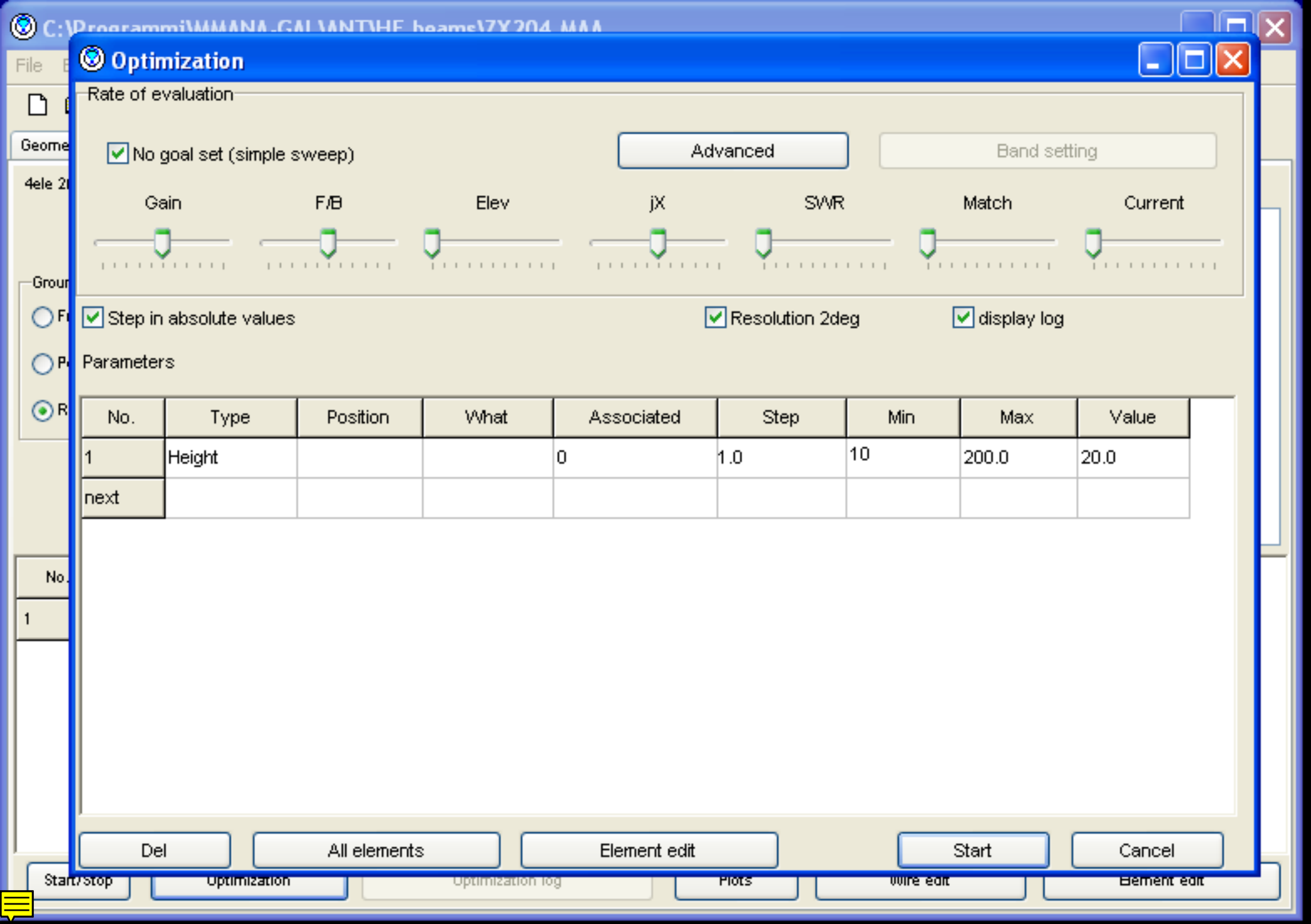
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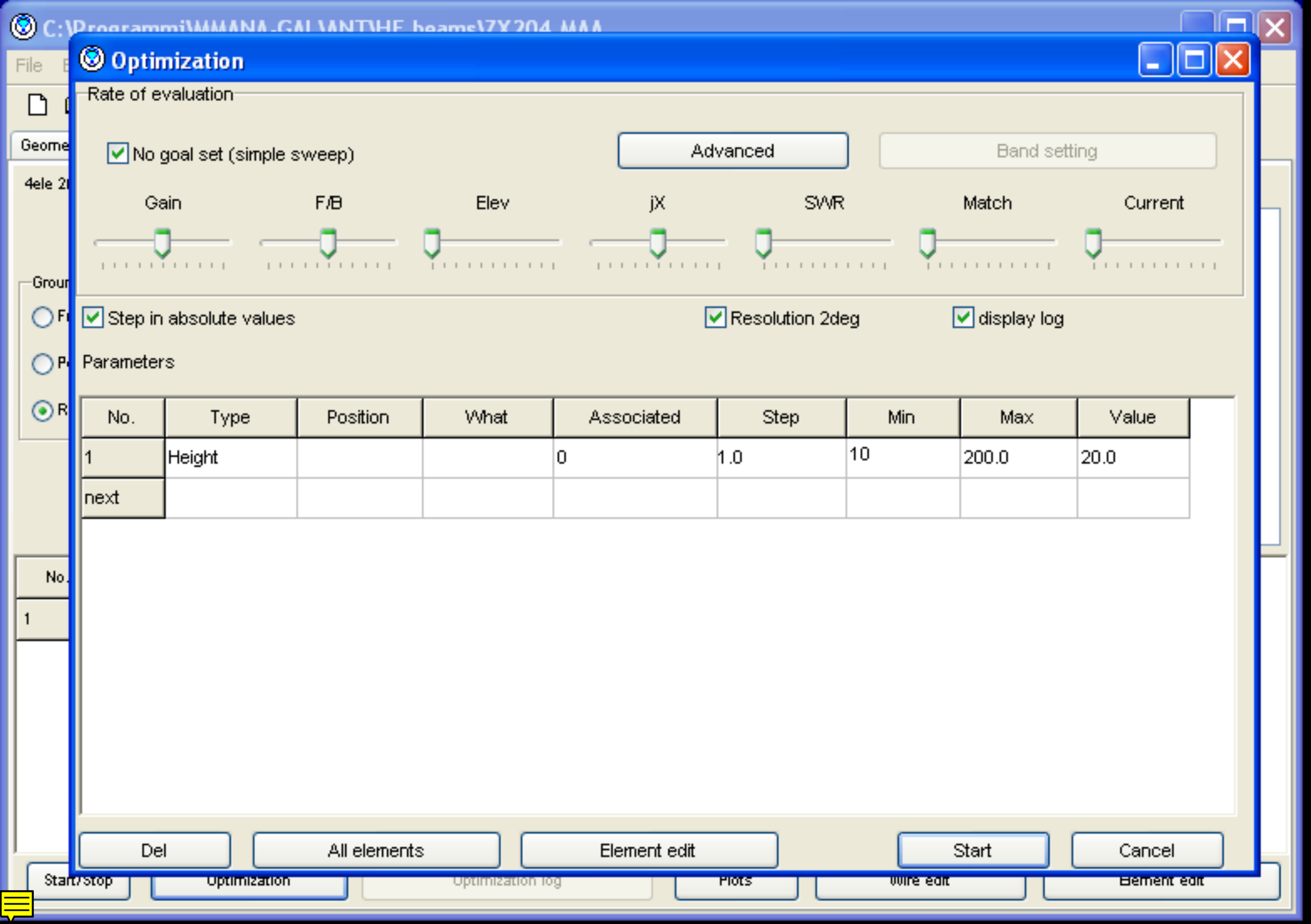
Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
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SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
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Optimization
Optimization log
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Wire edit
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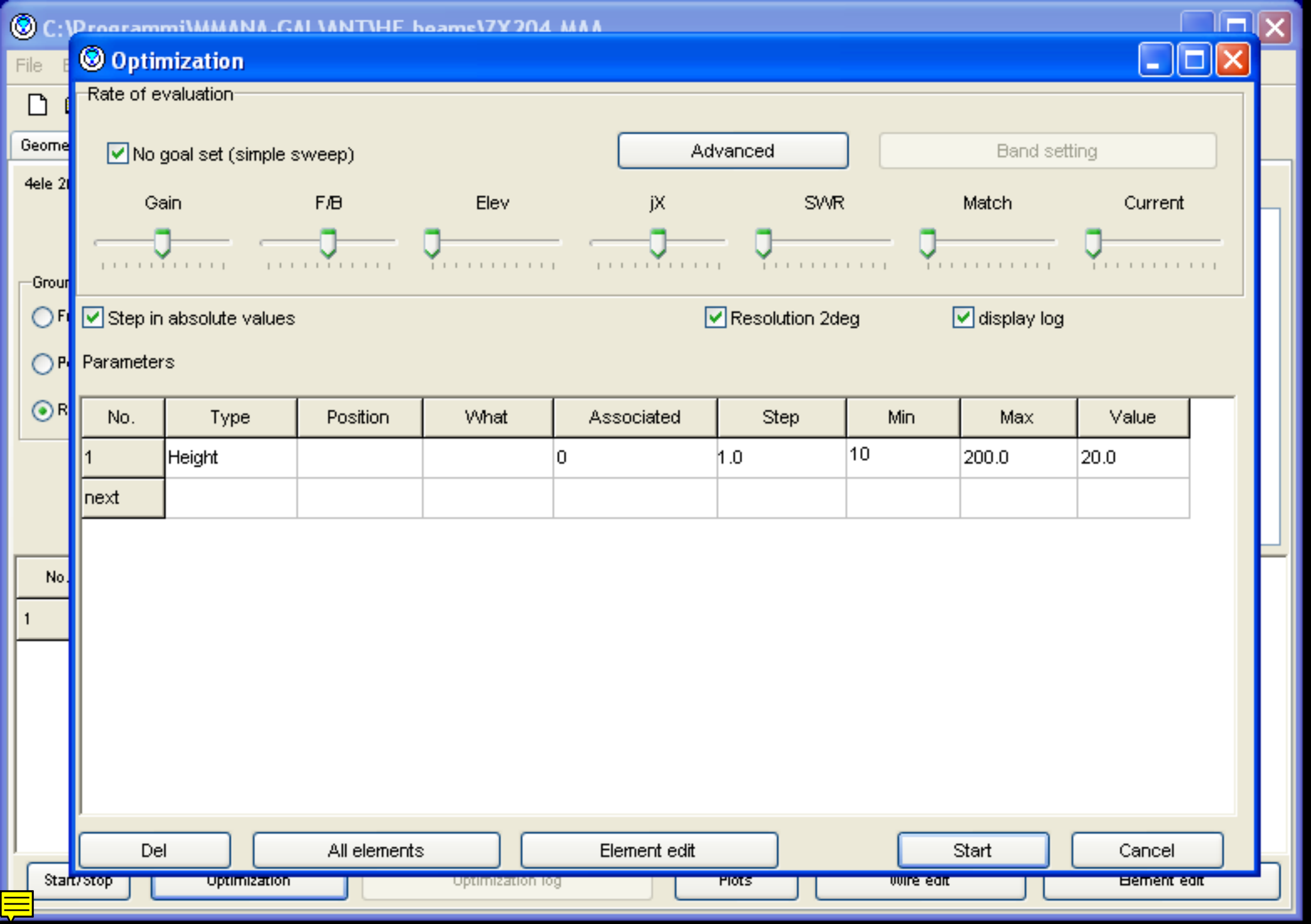
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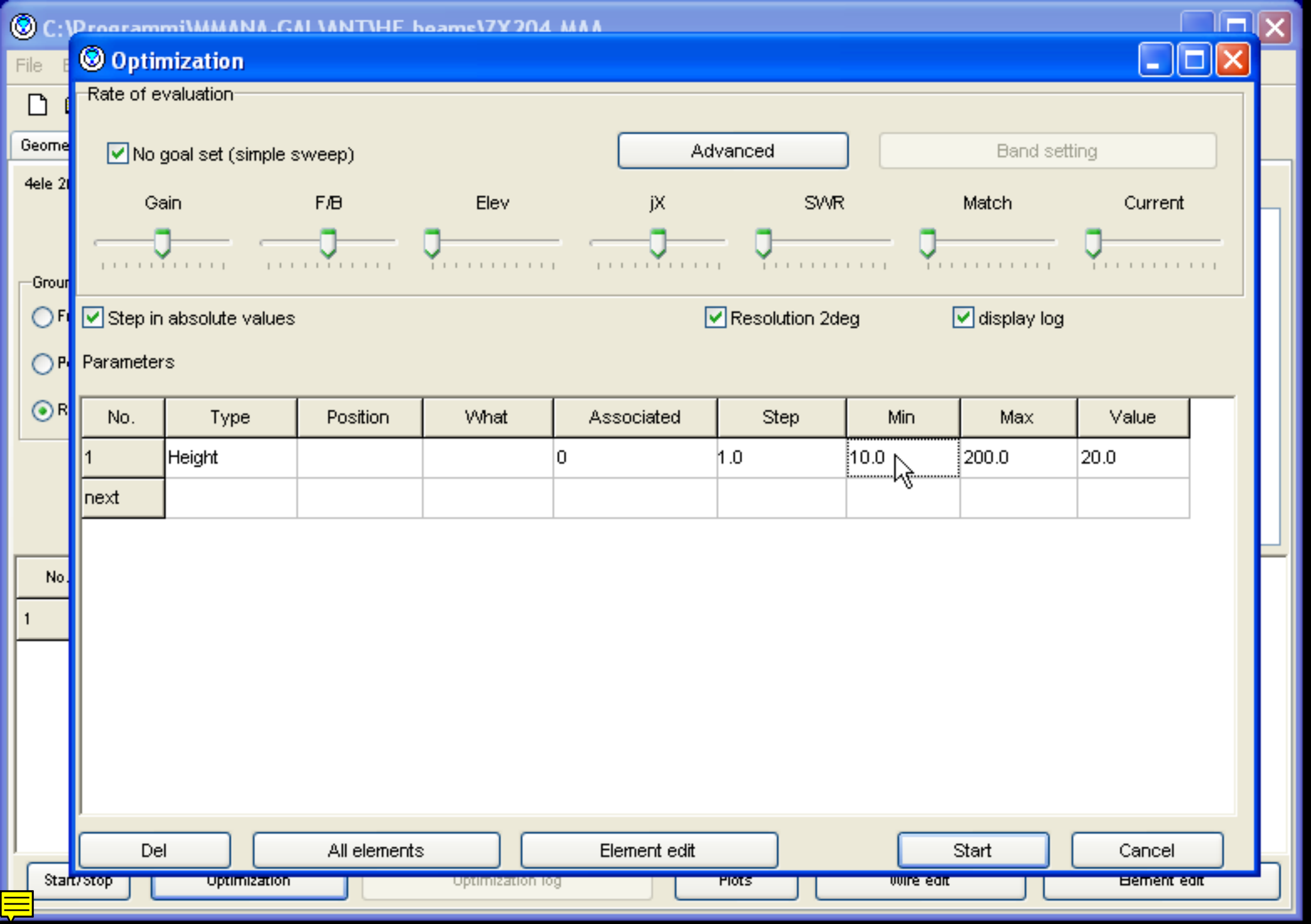
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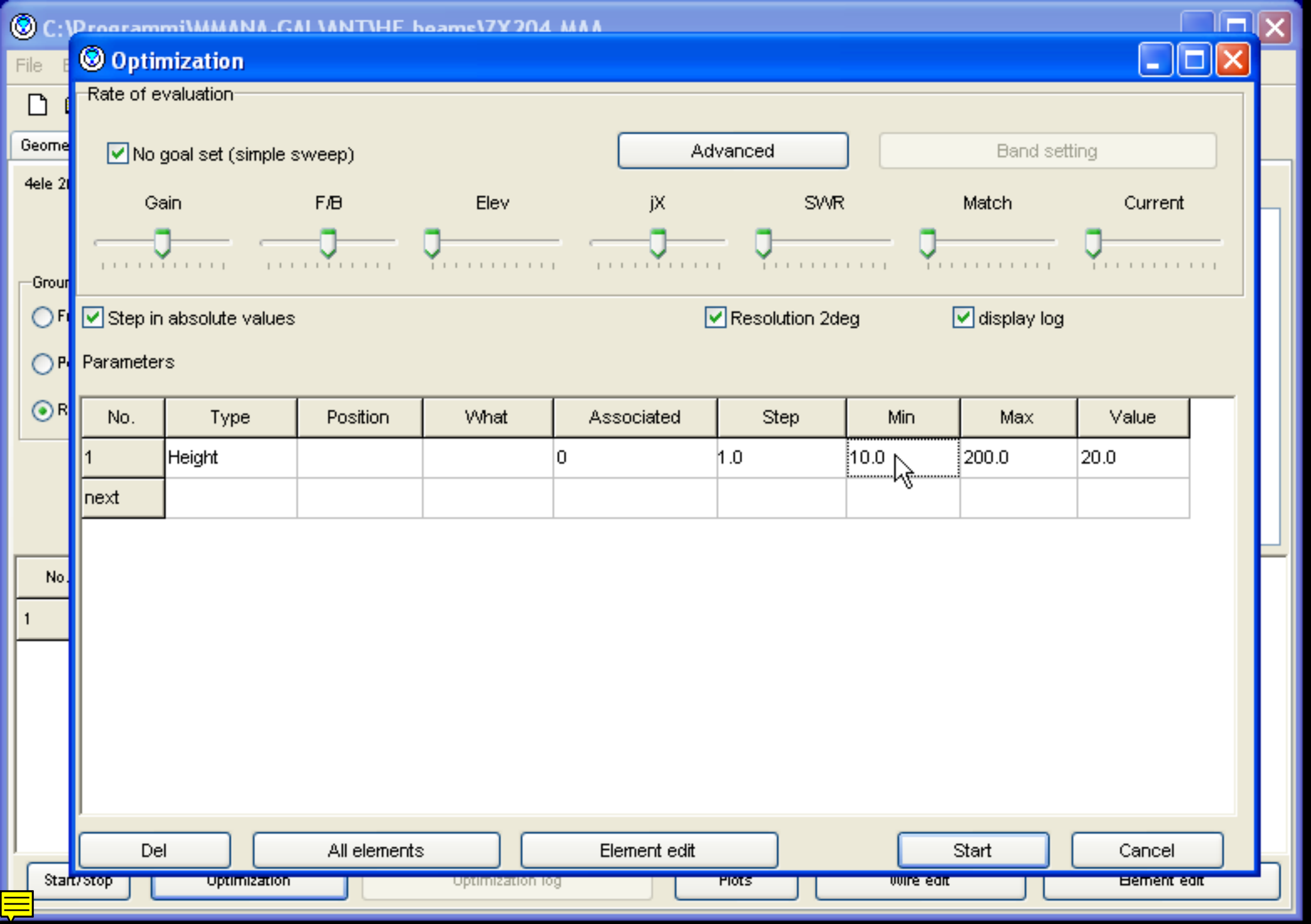
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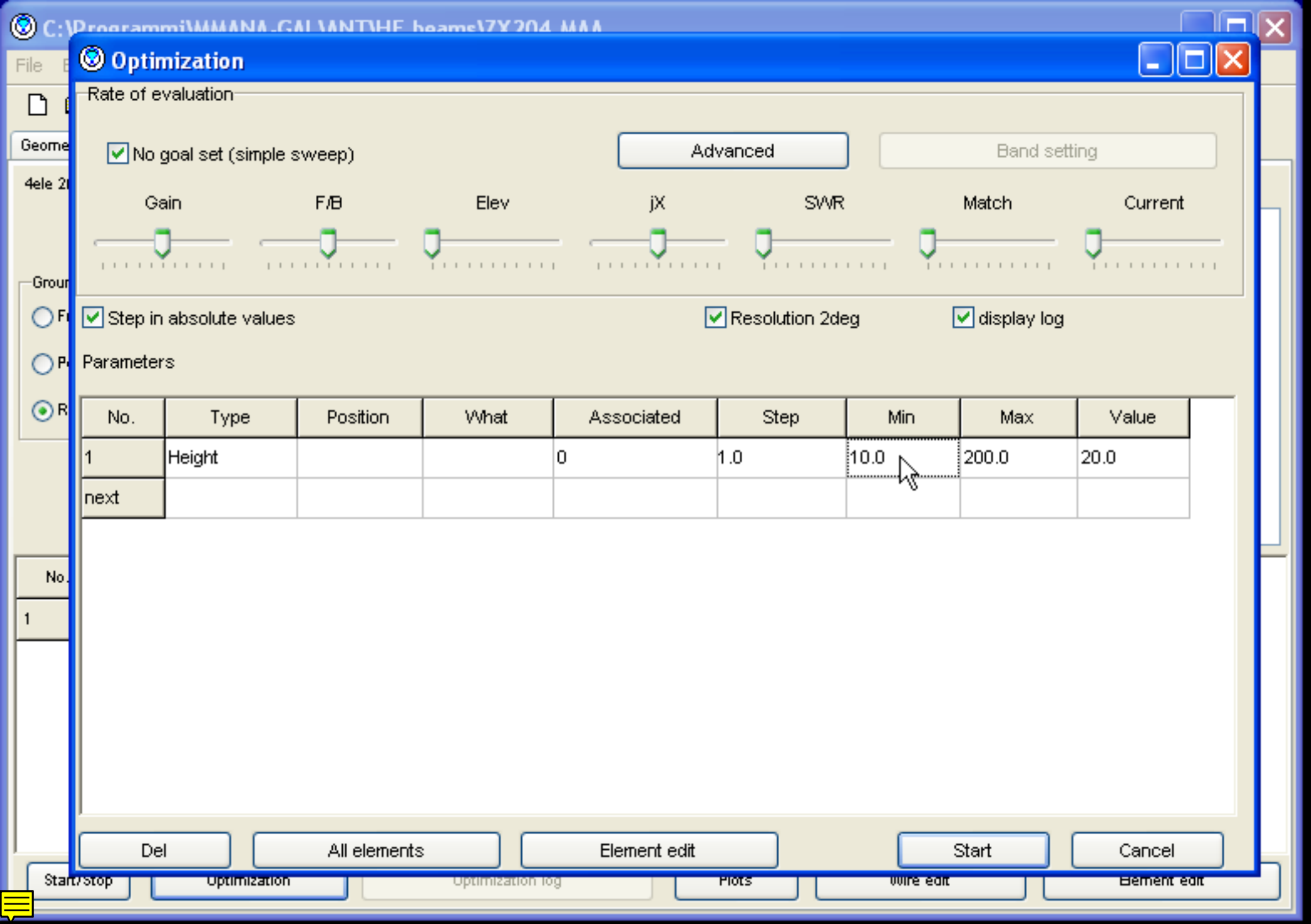
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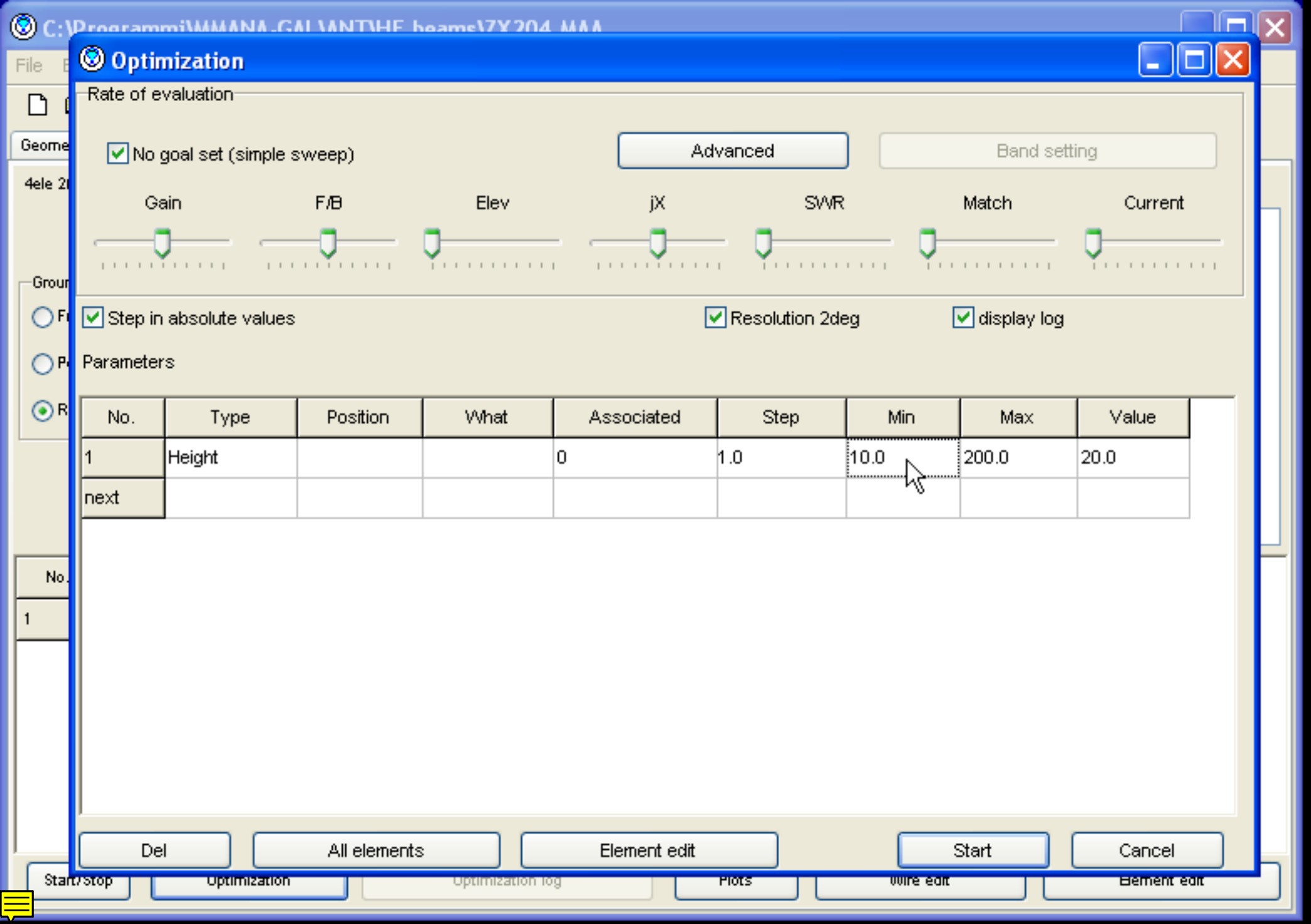
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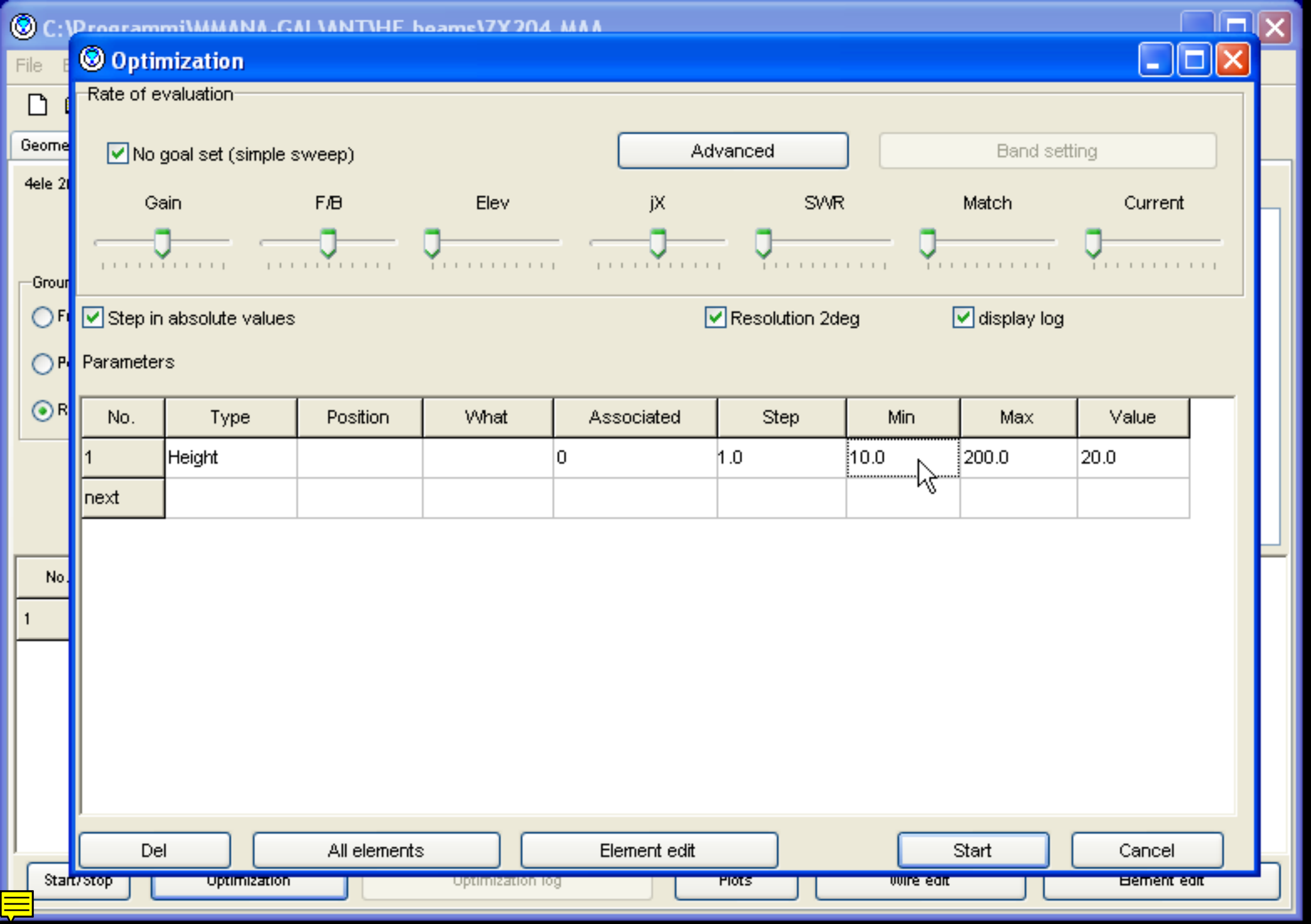
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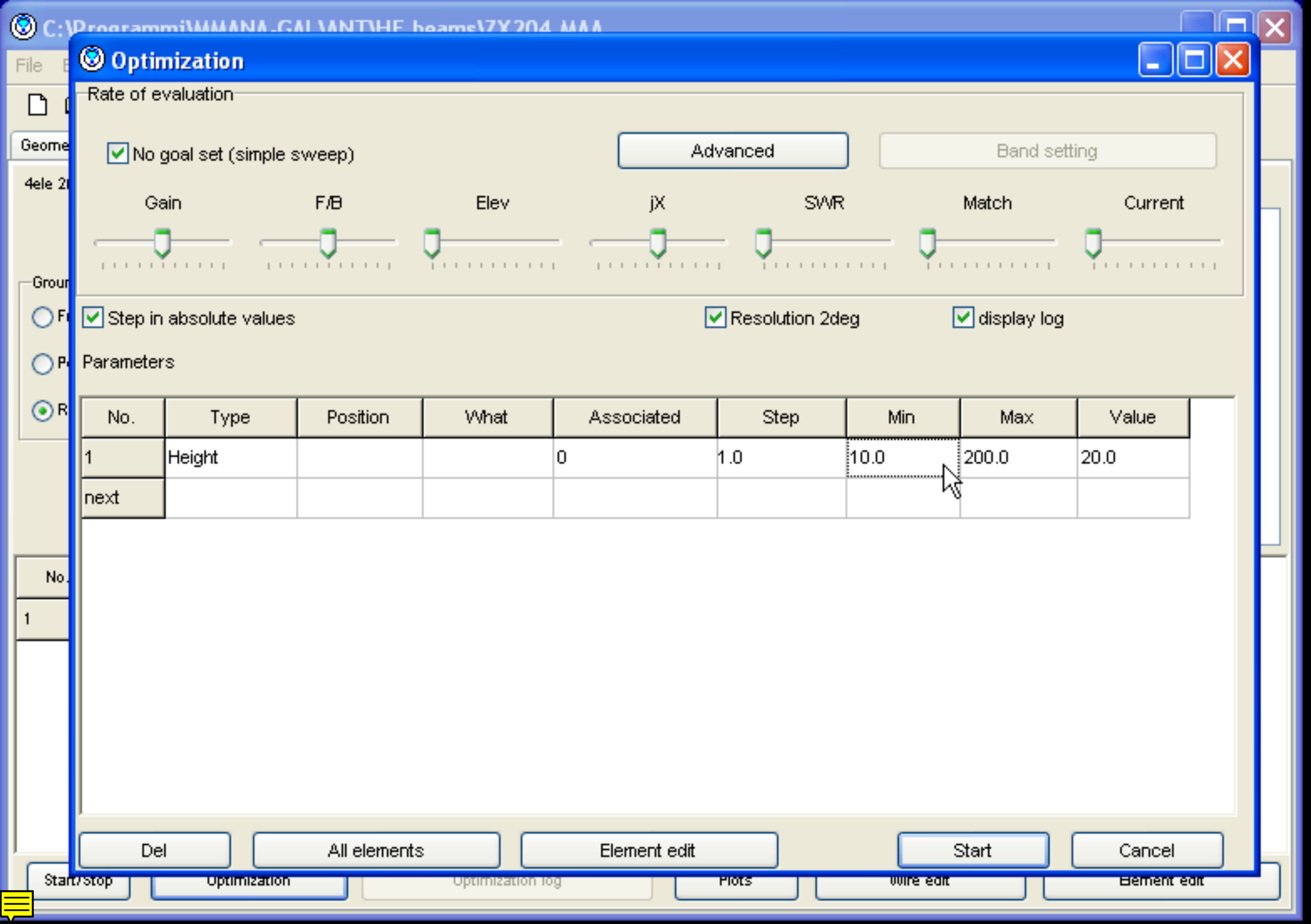
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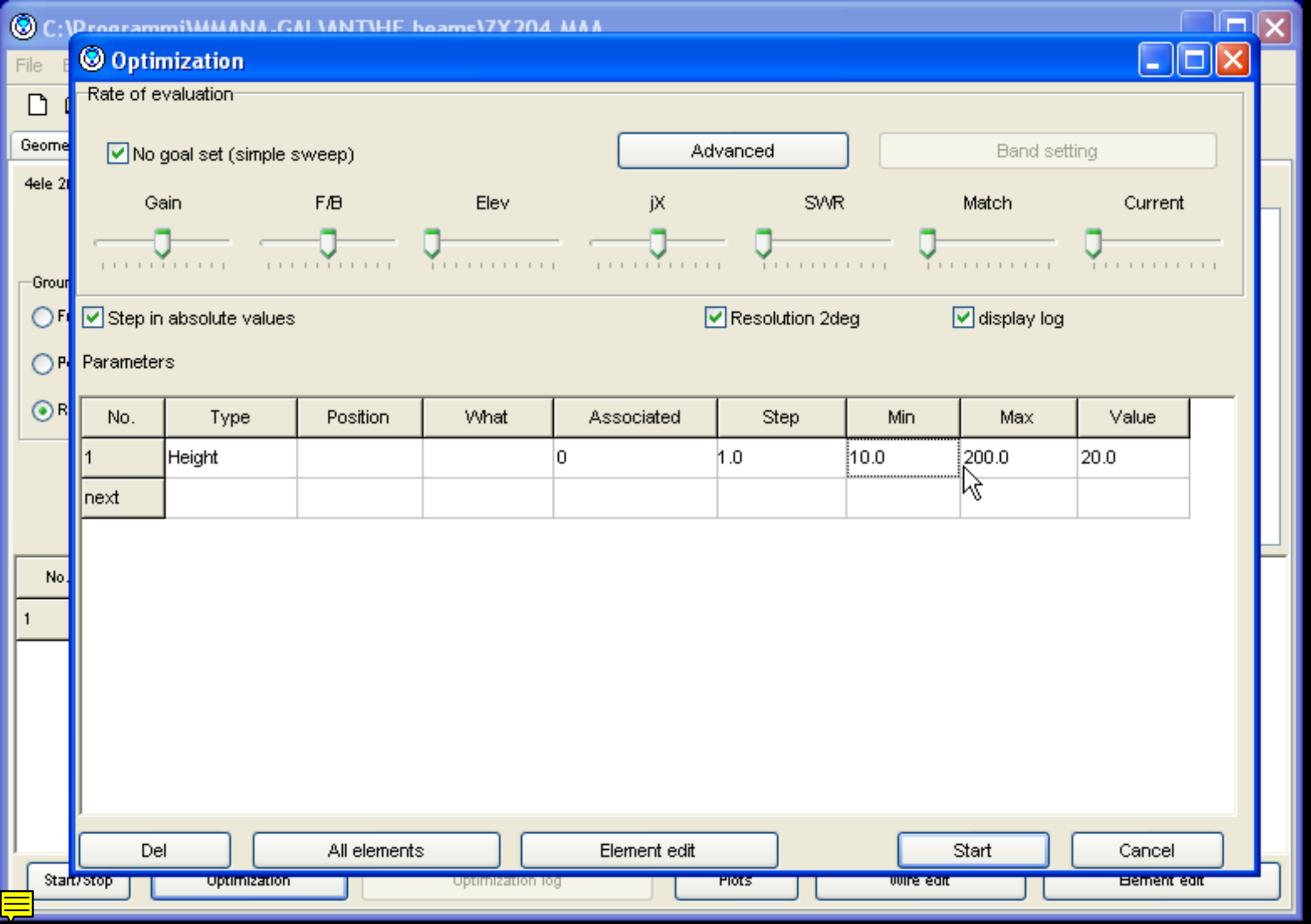
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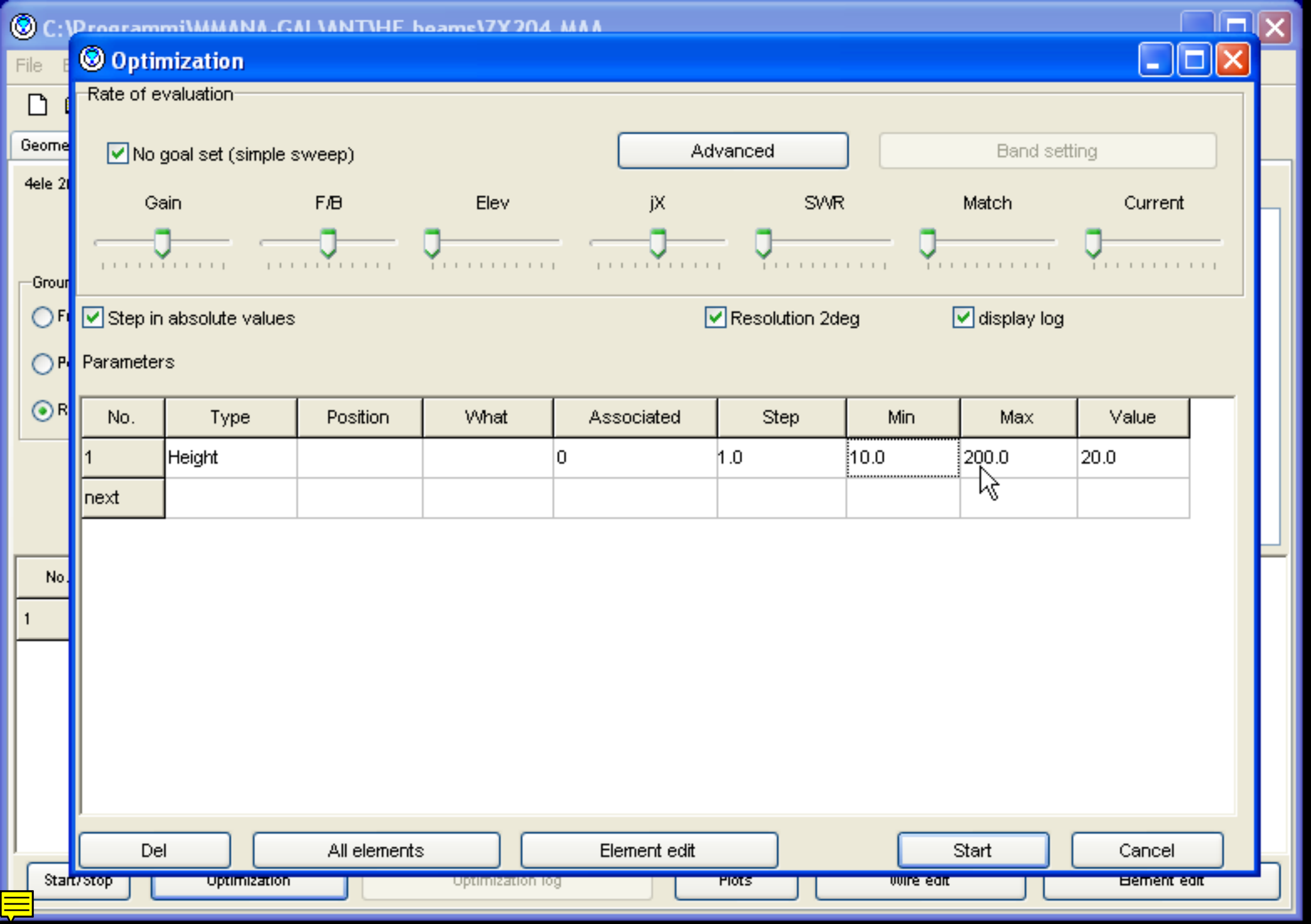
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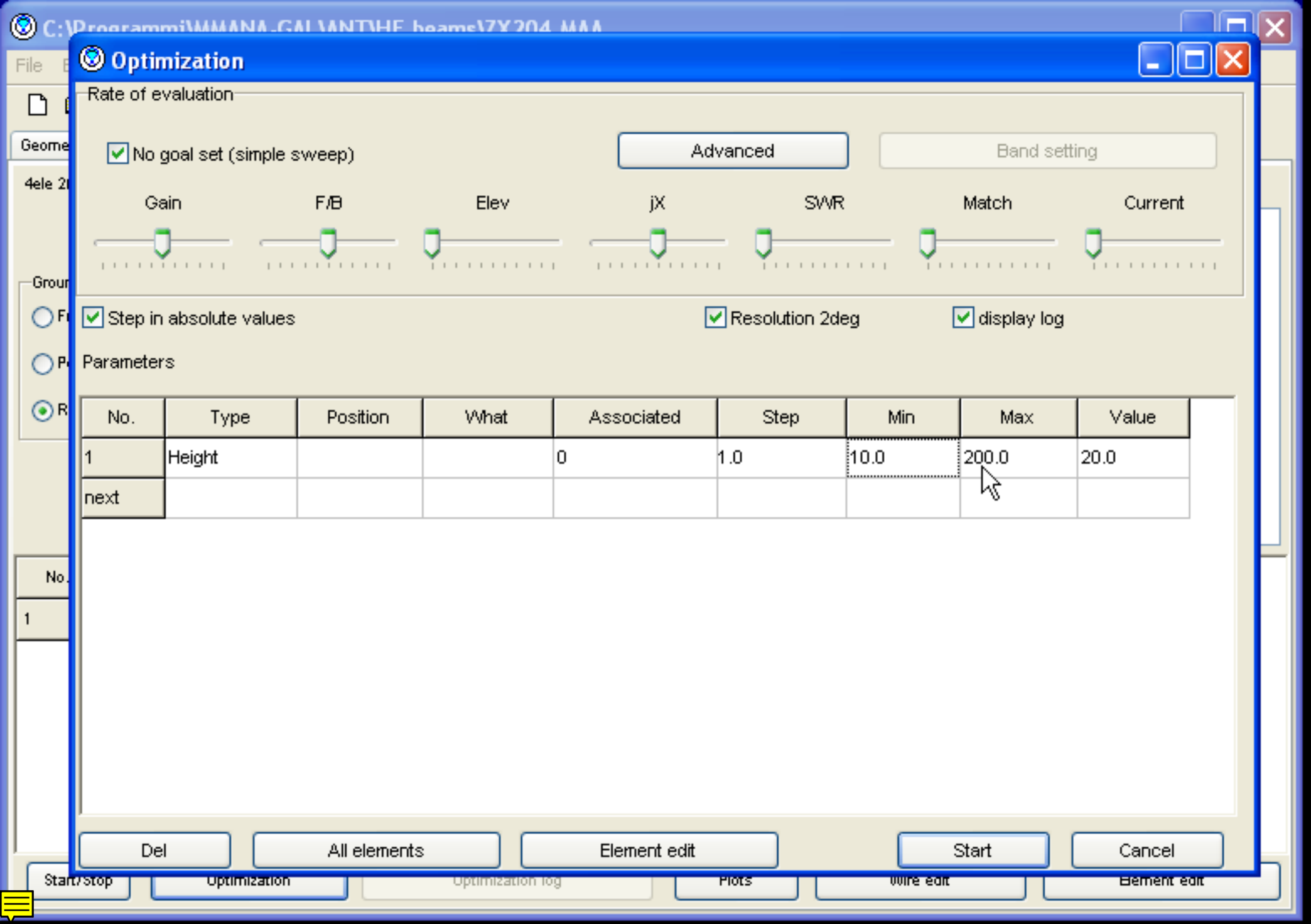
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Rate of evaluation
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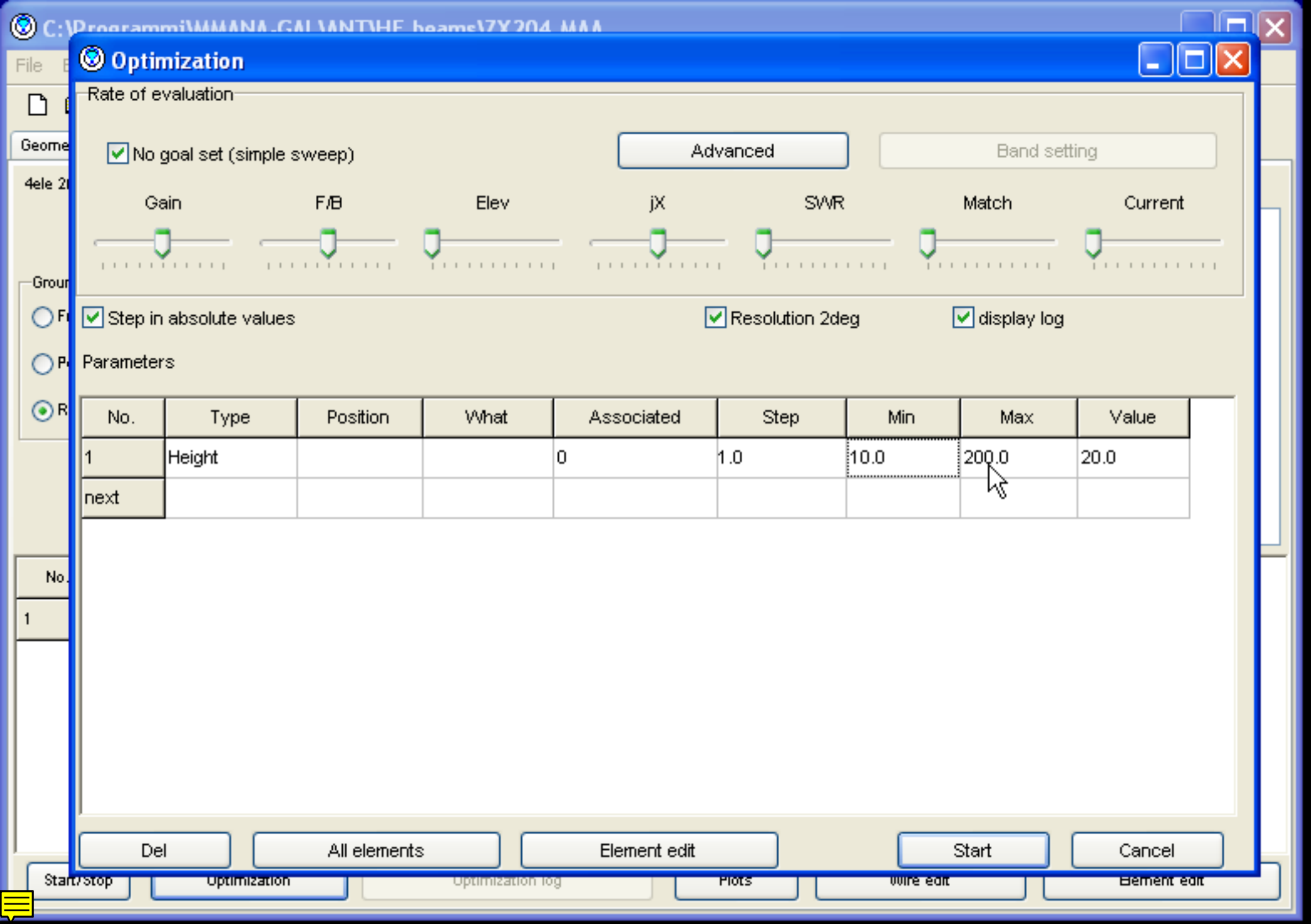
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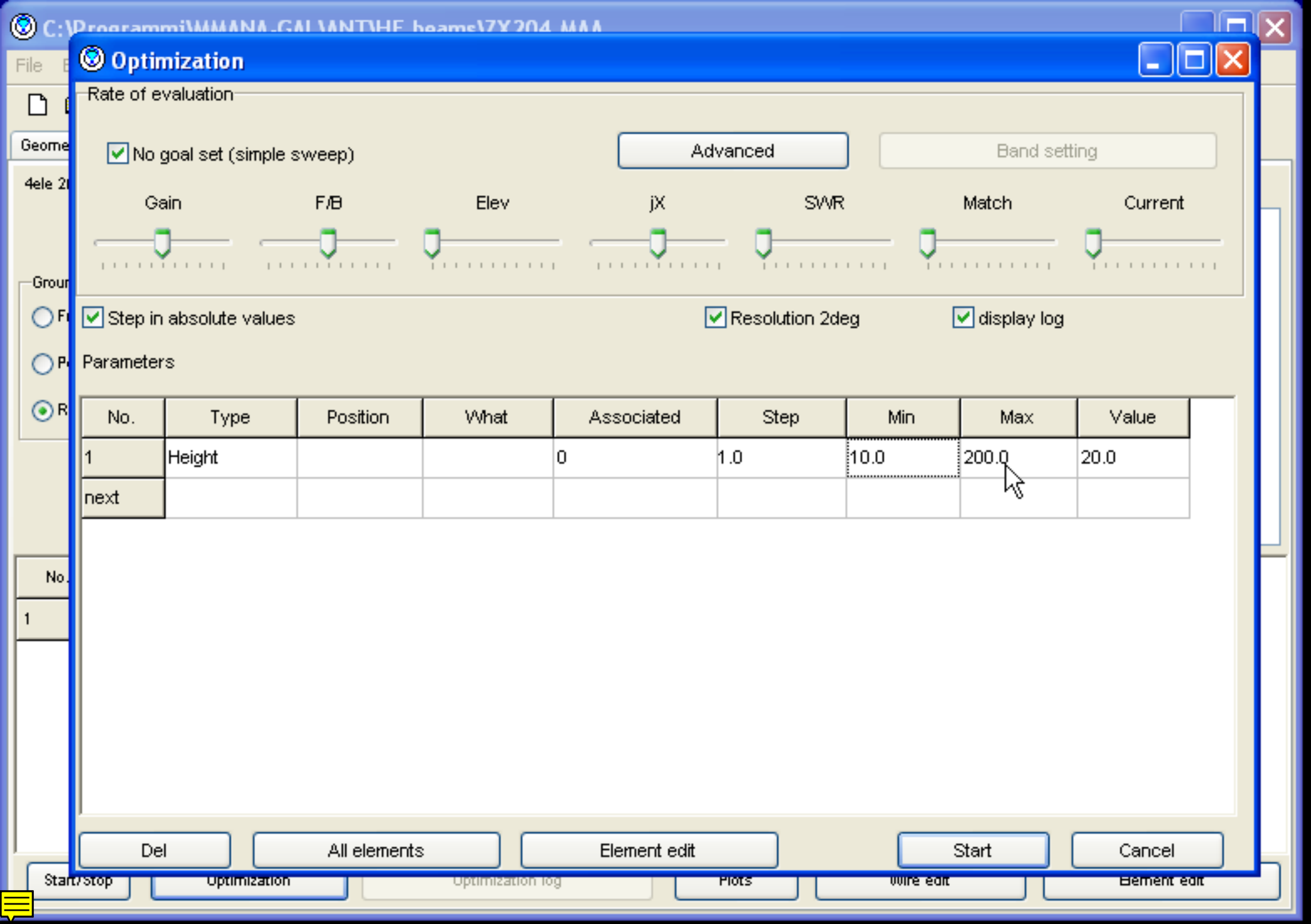
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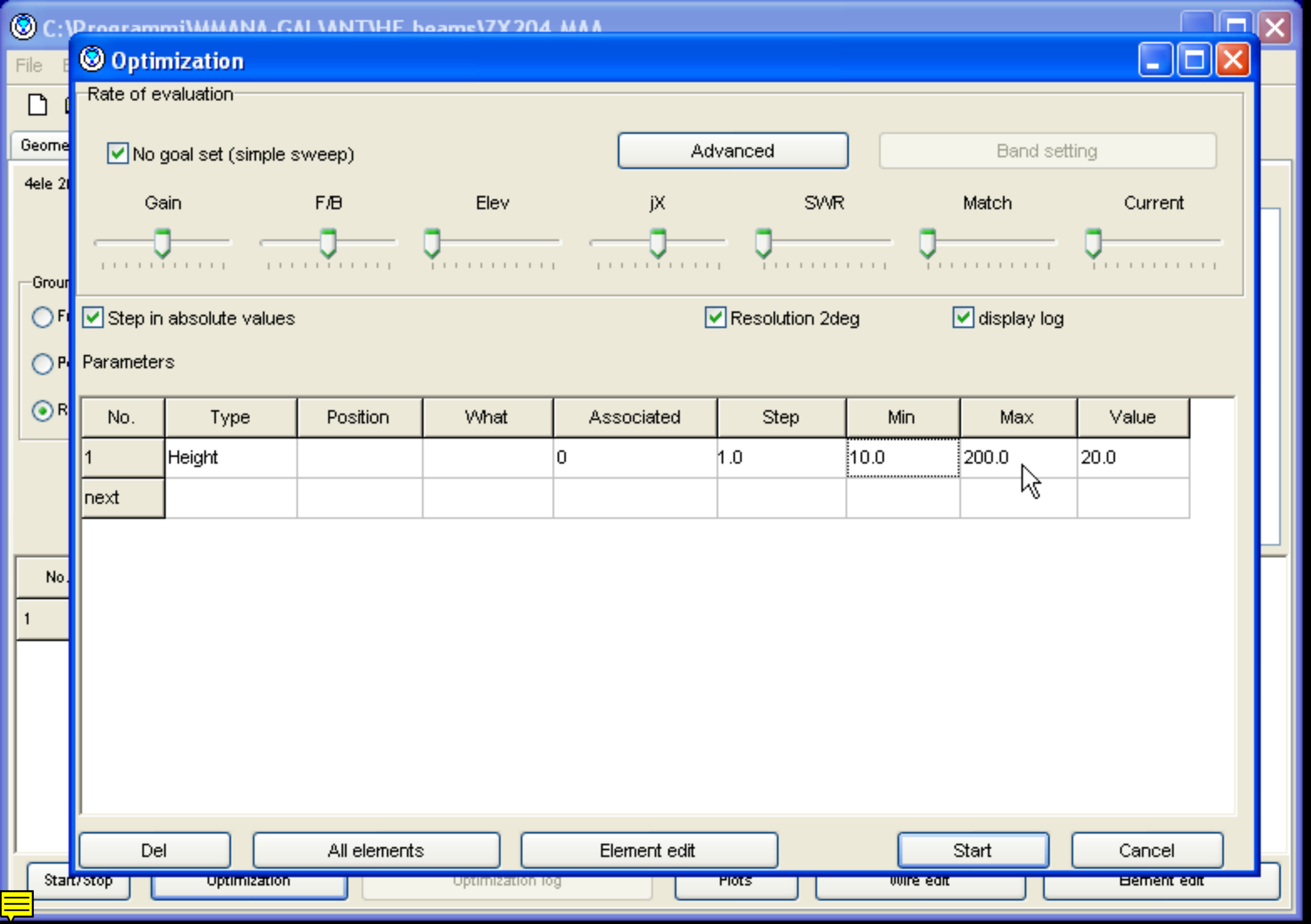
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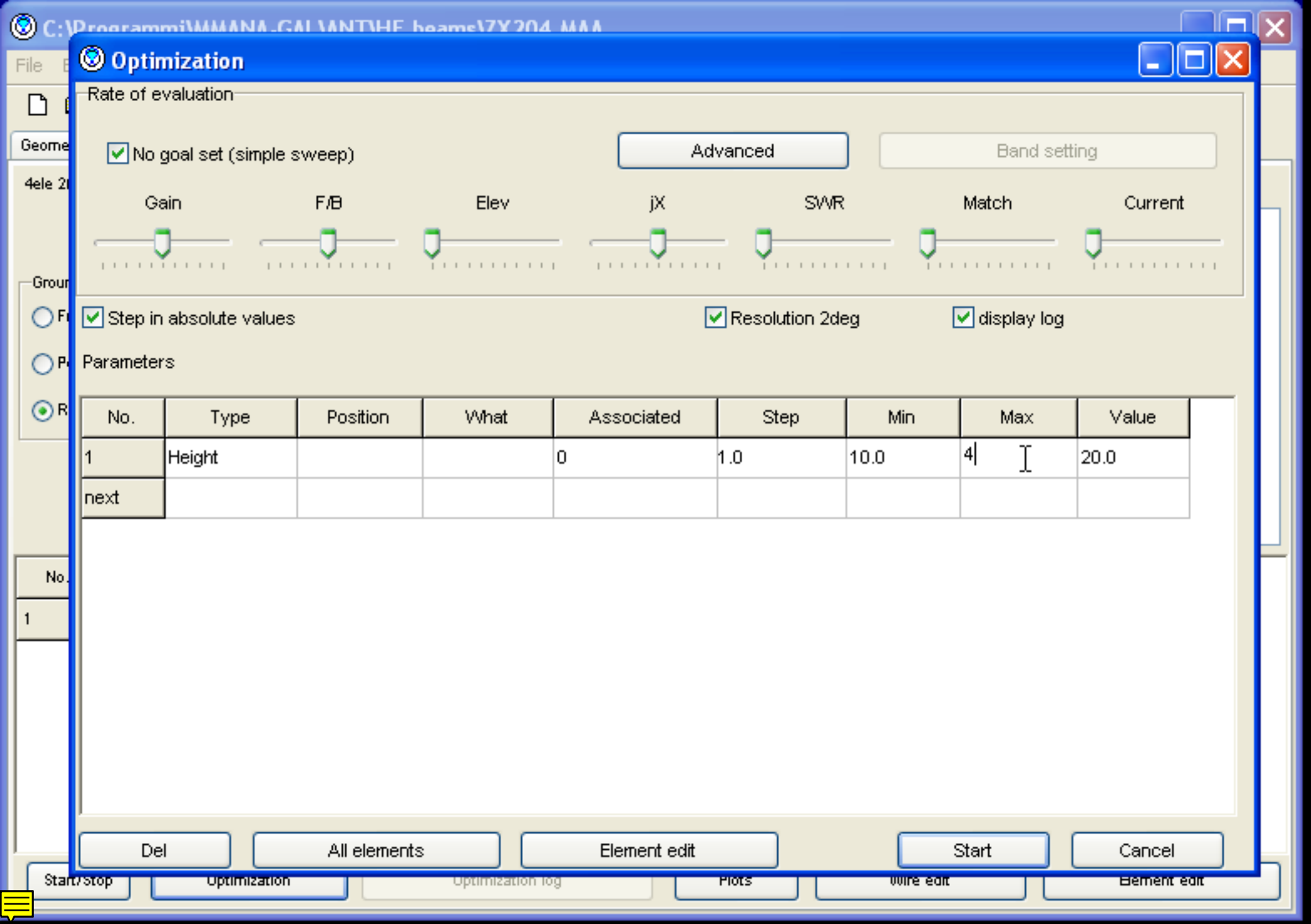
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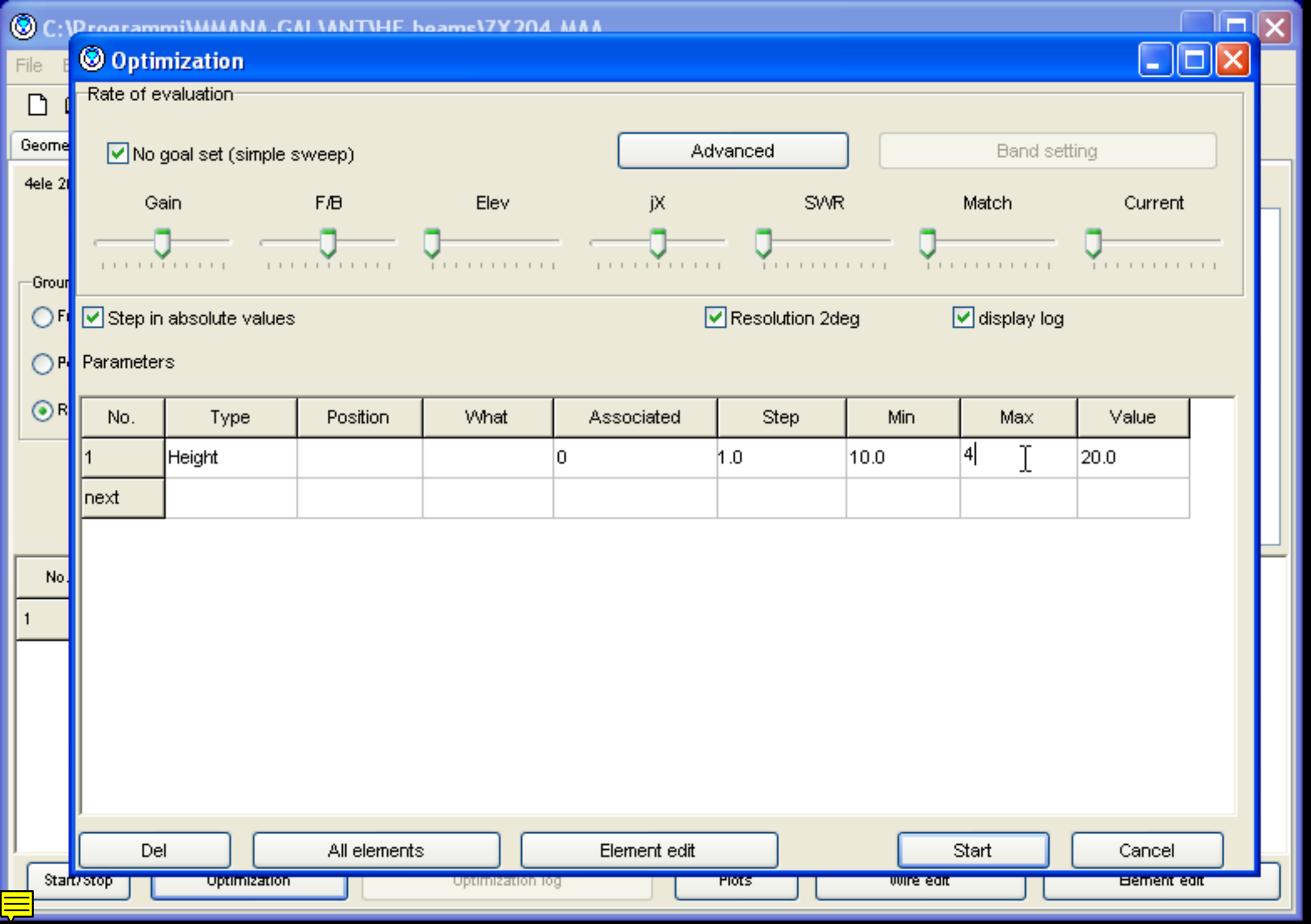
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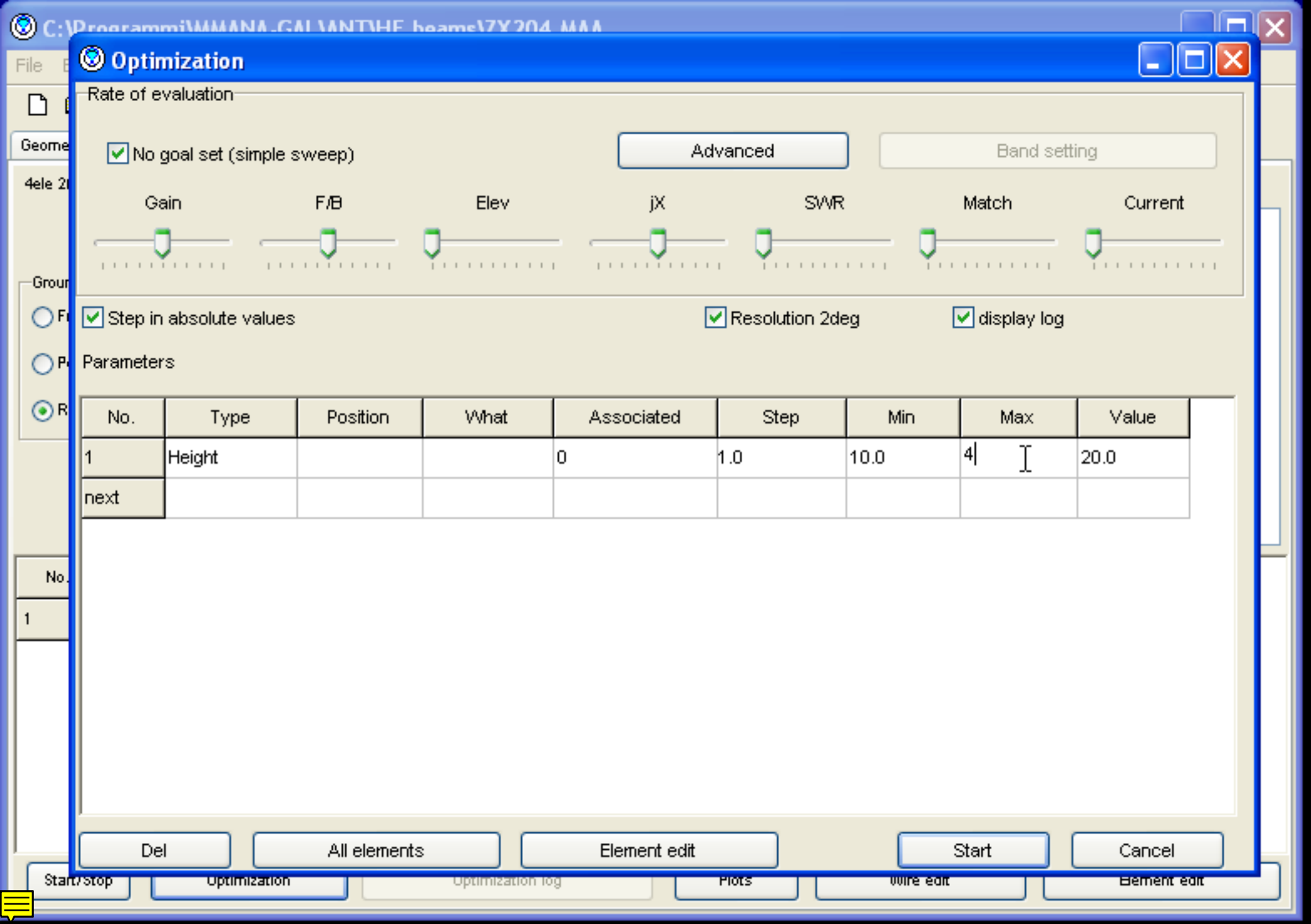
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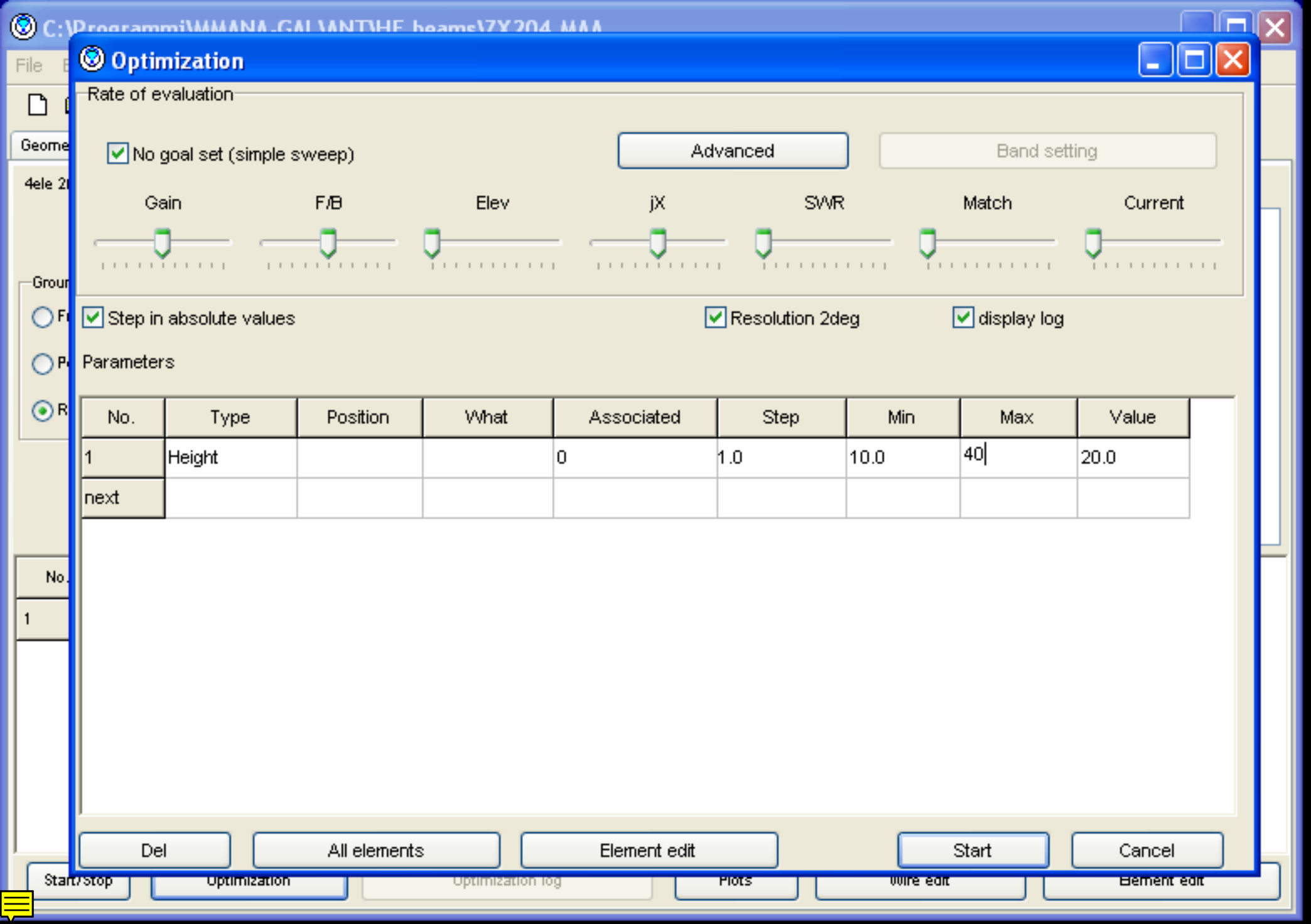
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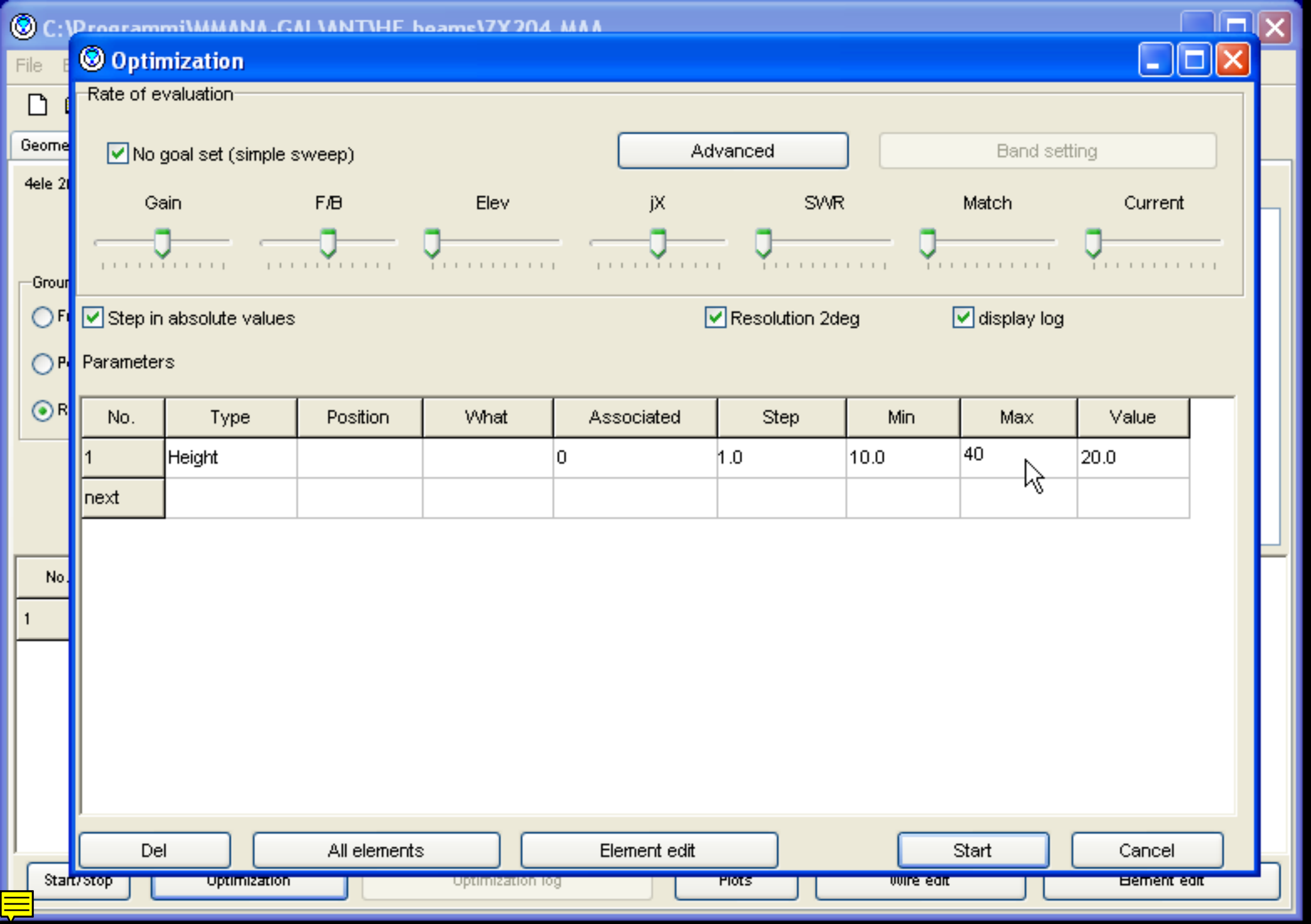
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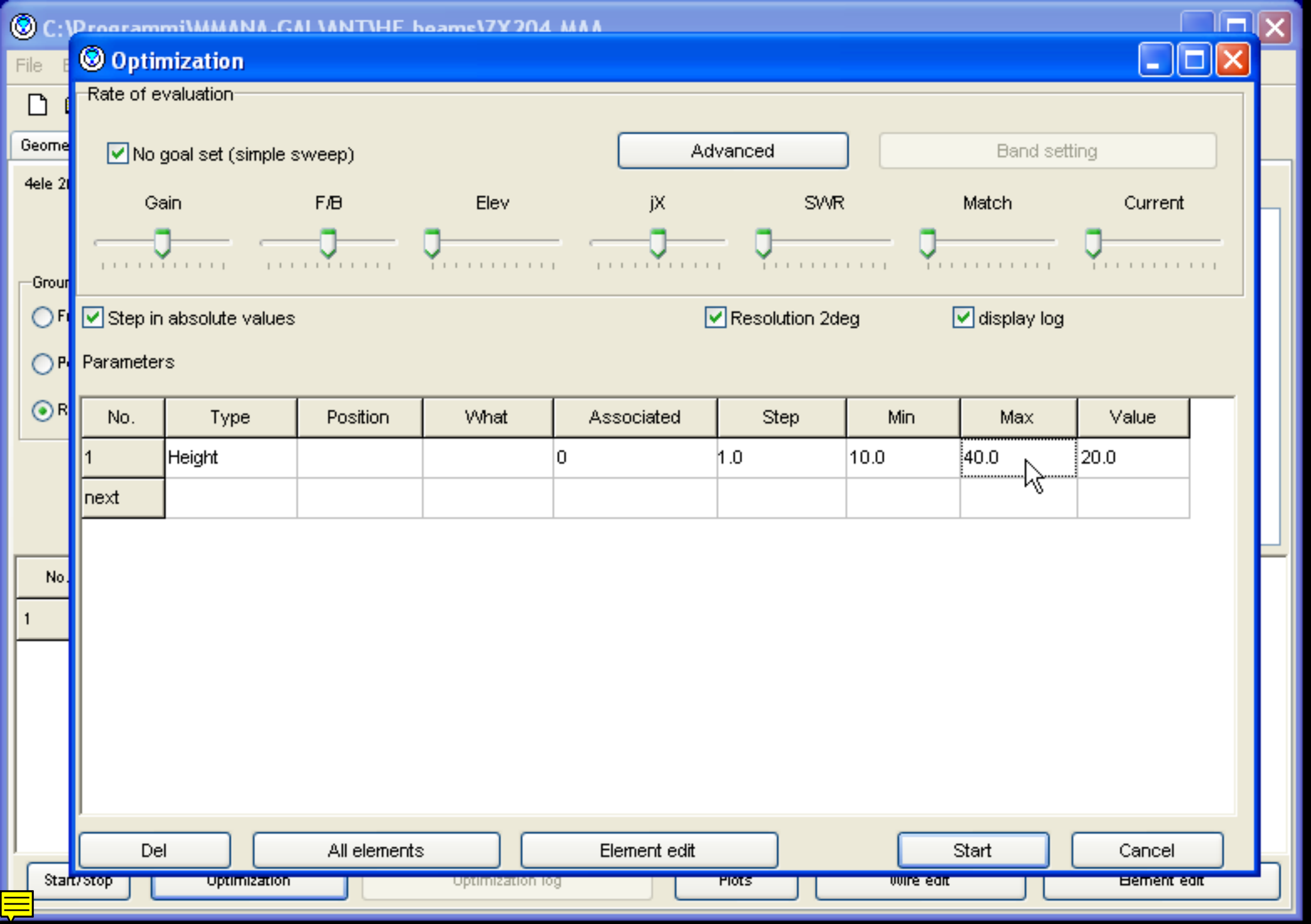
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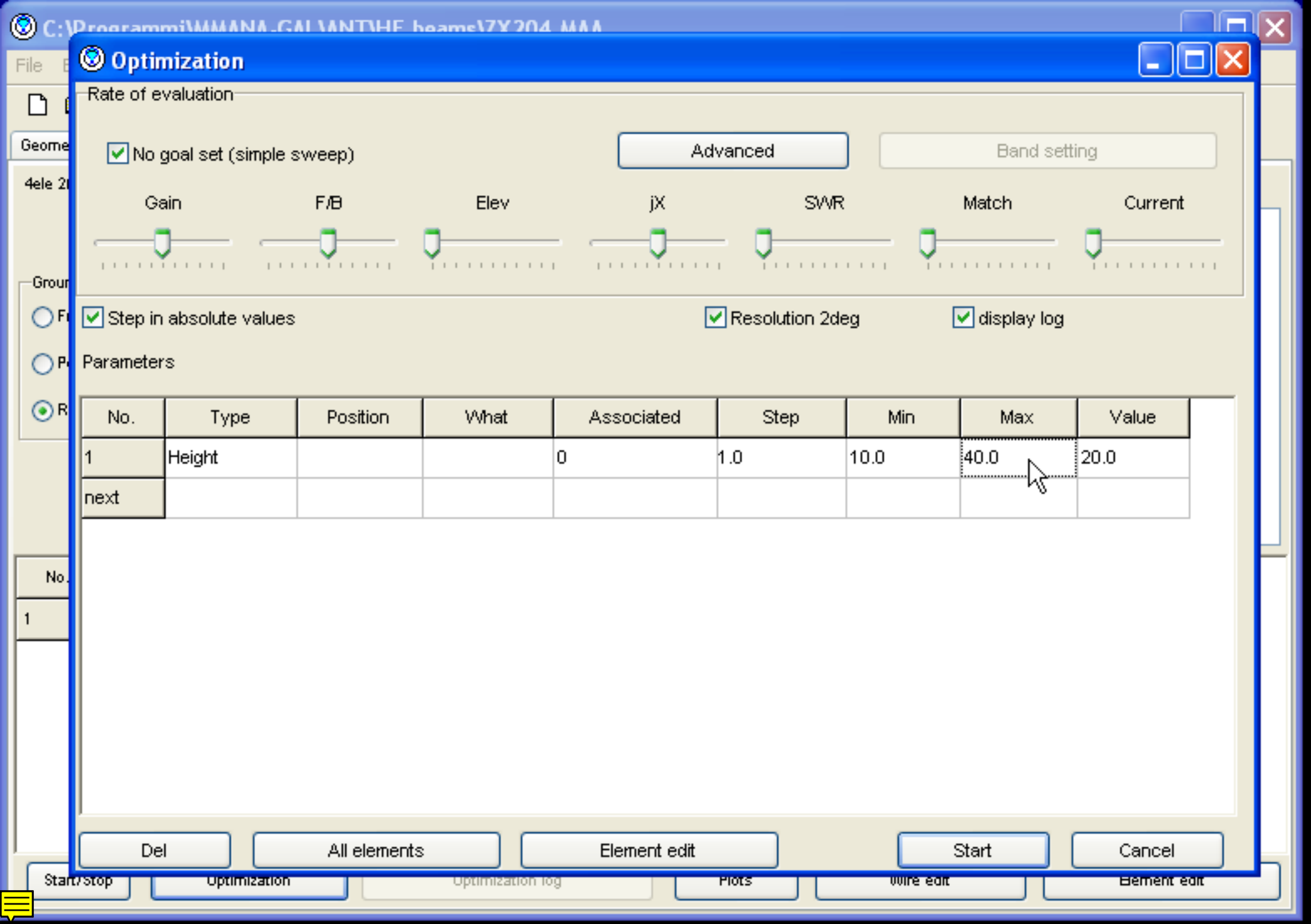
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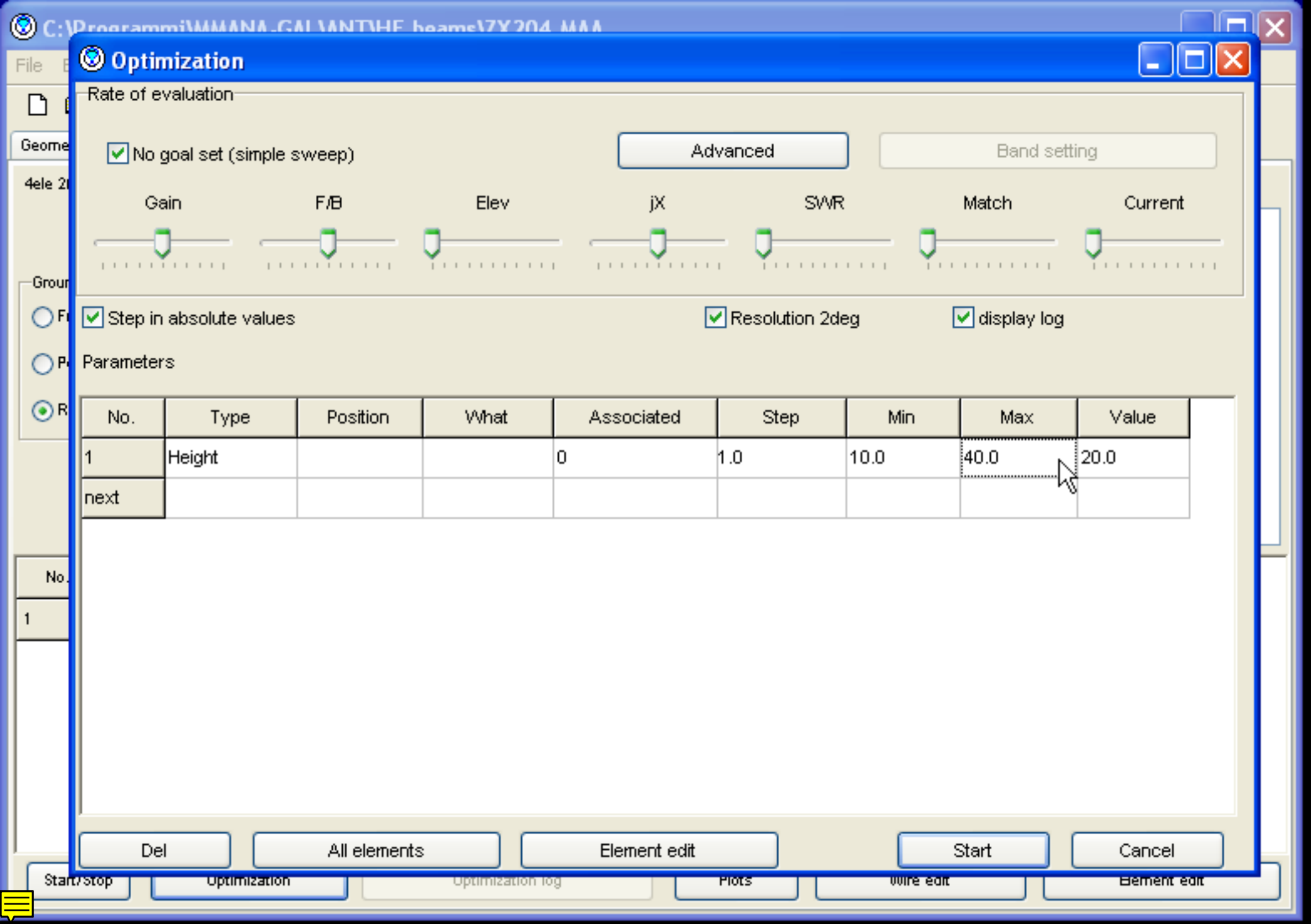
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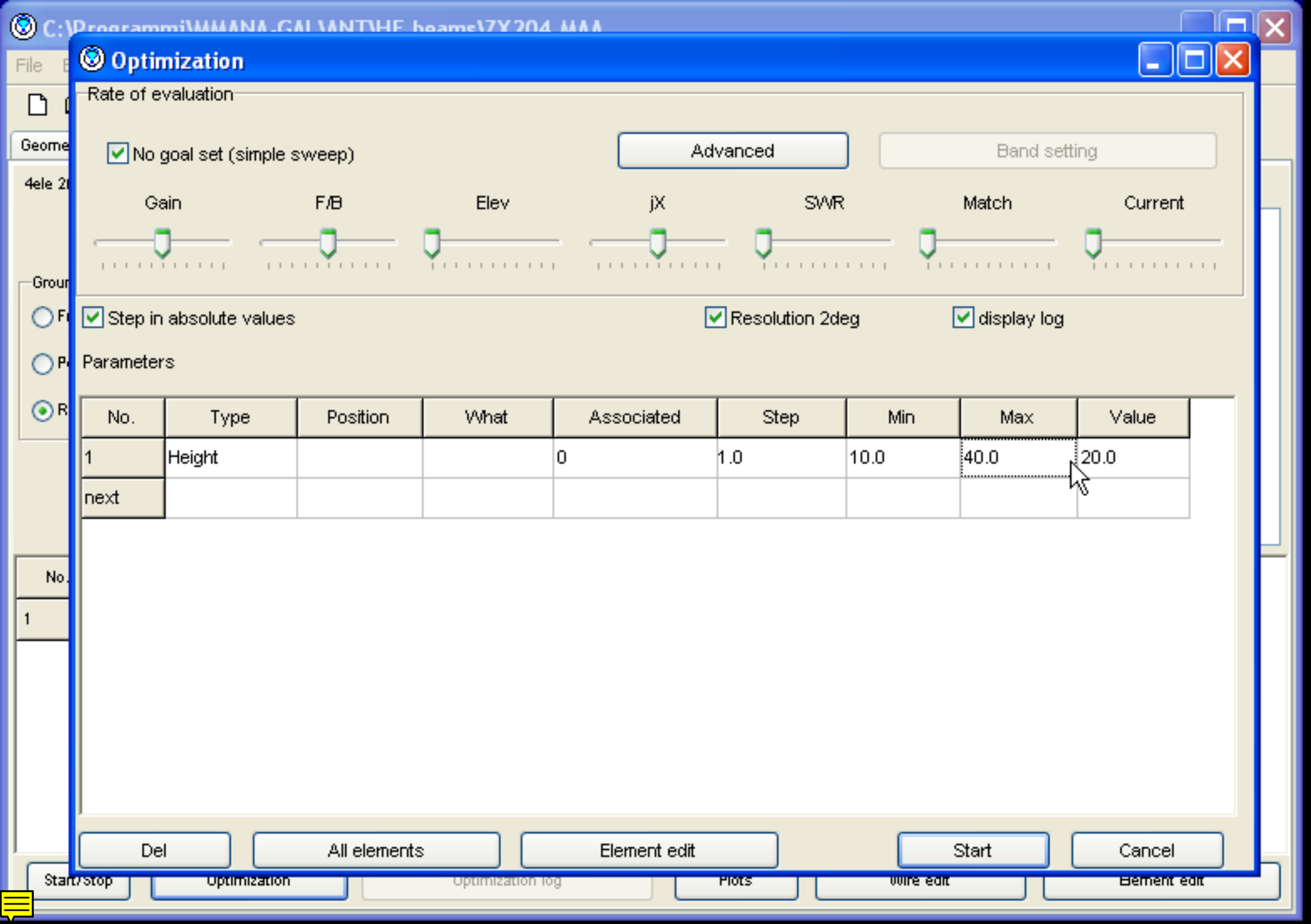
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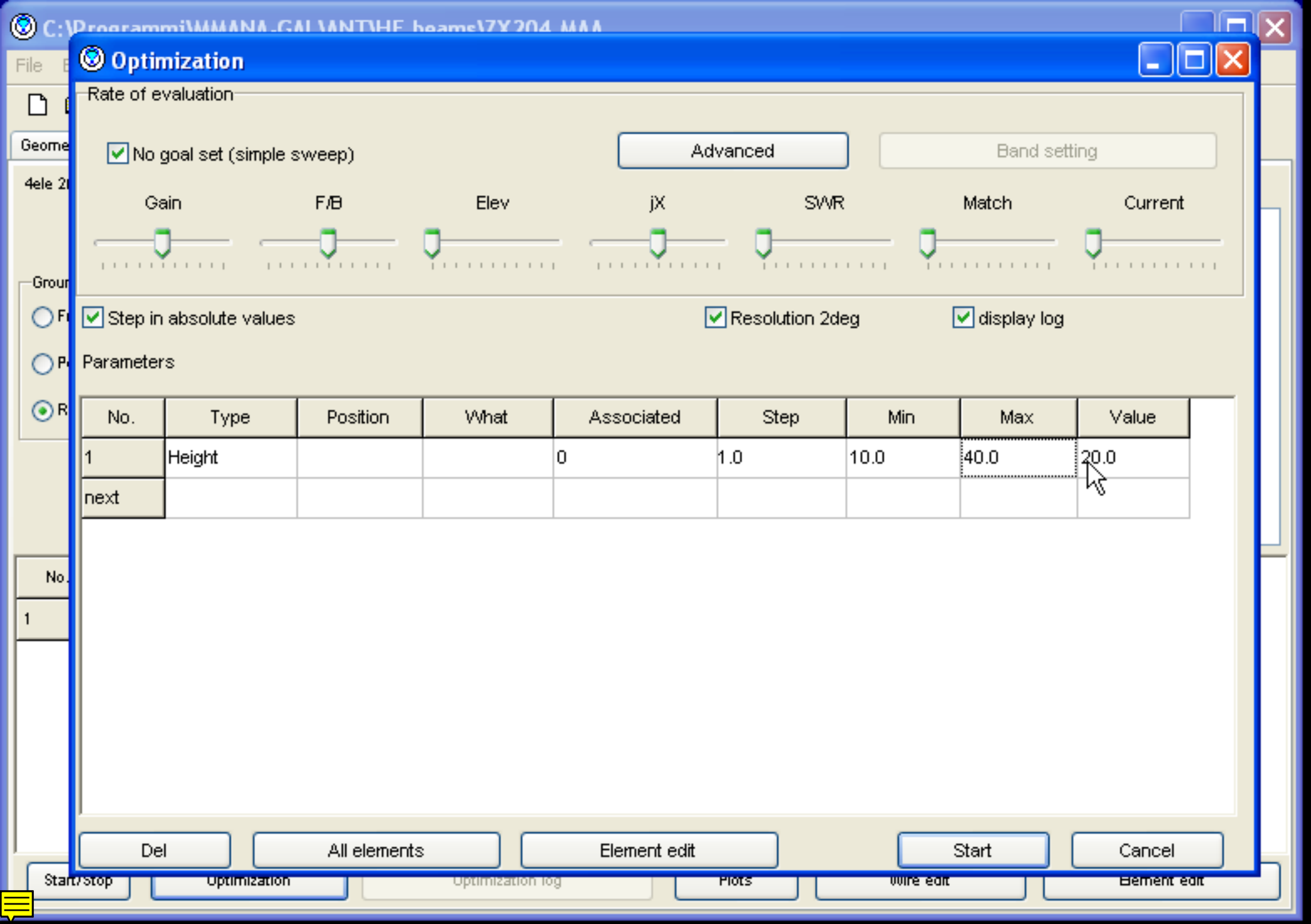
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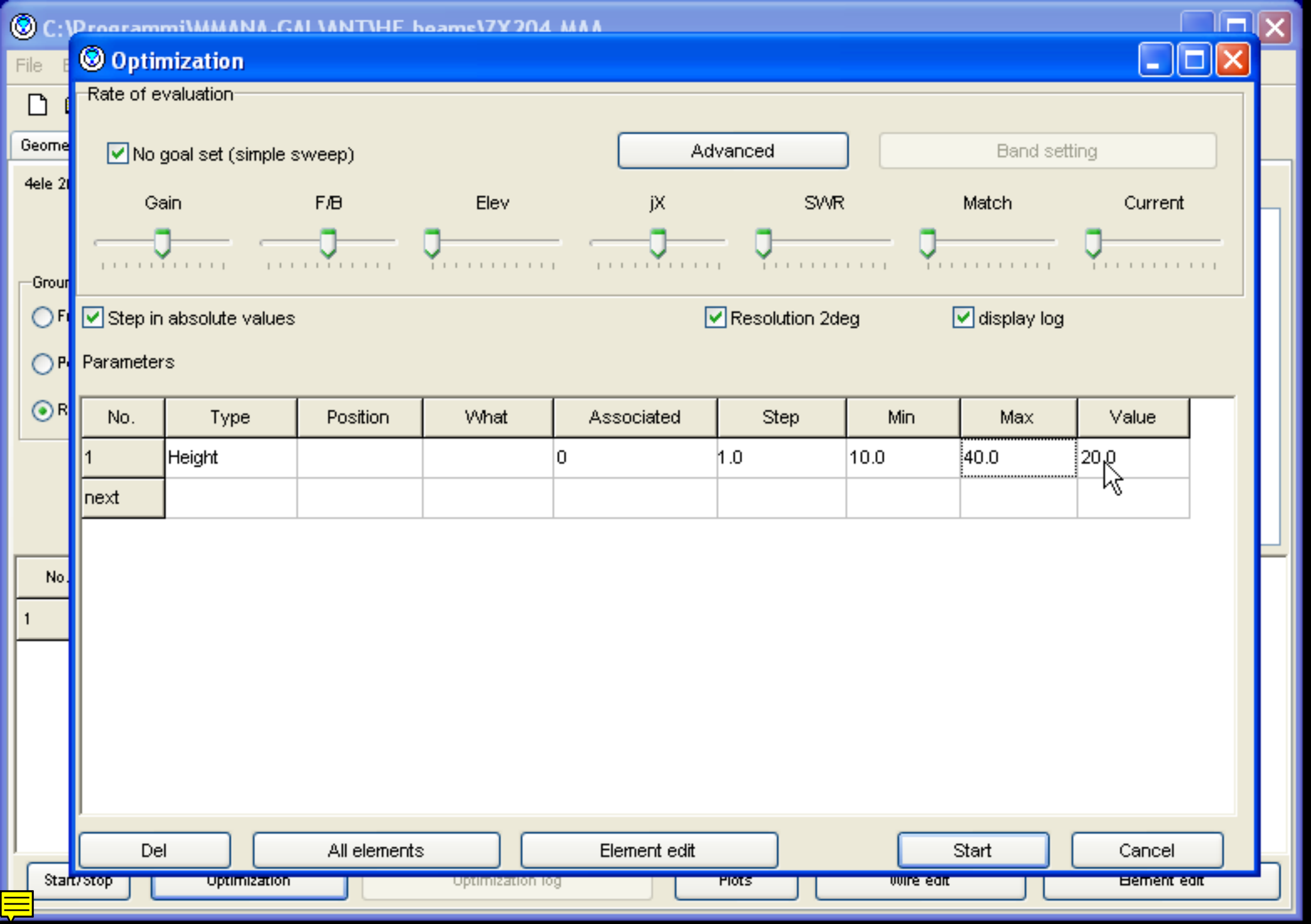
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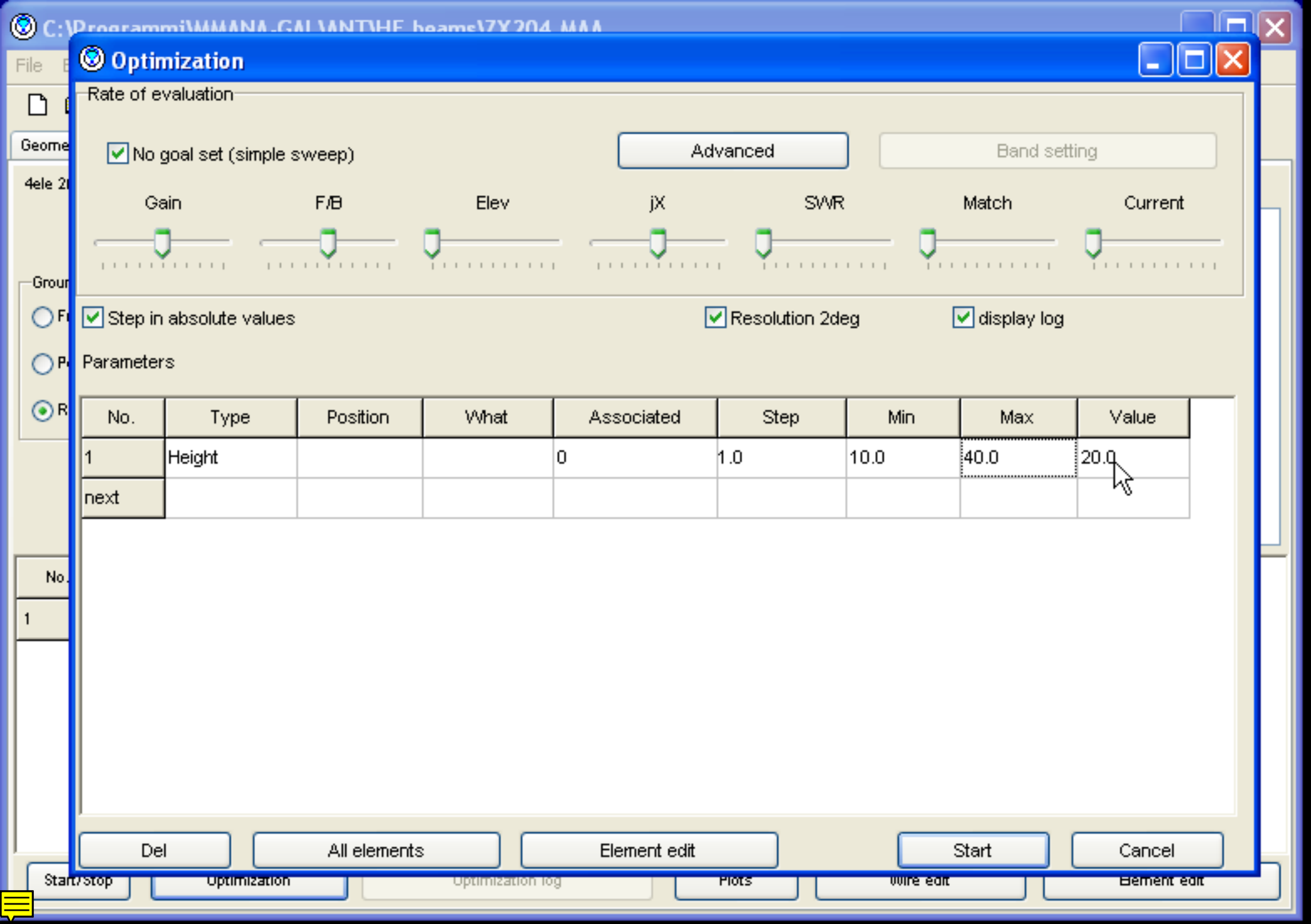
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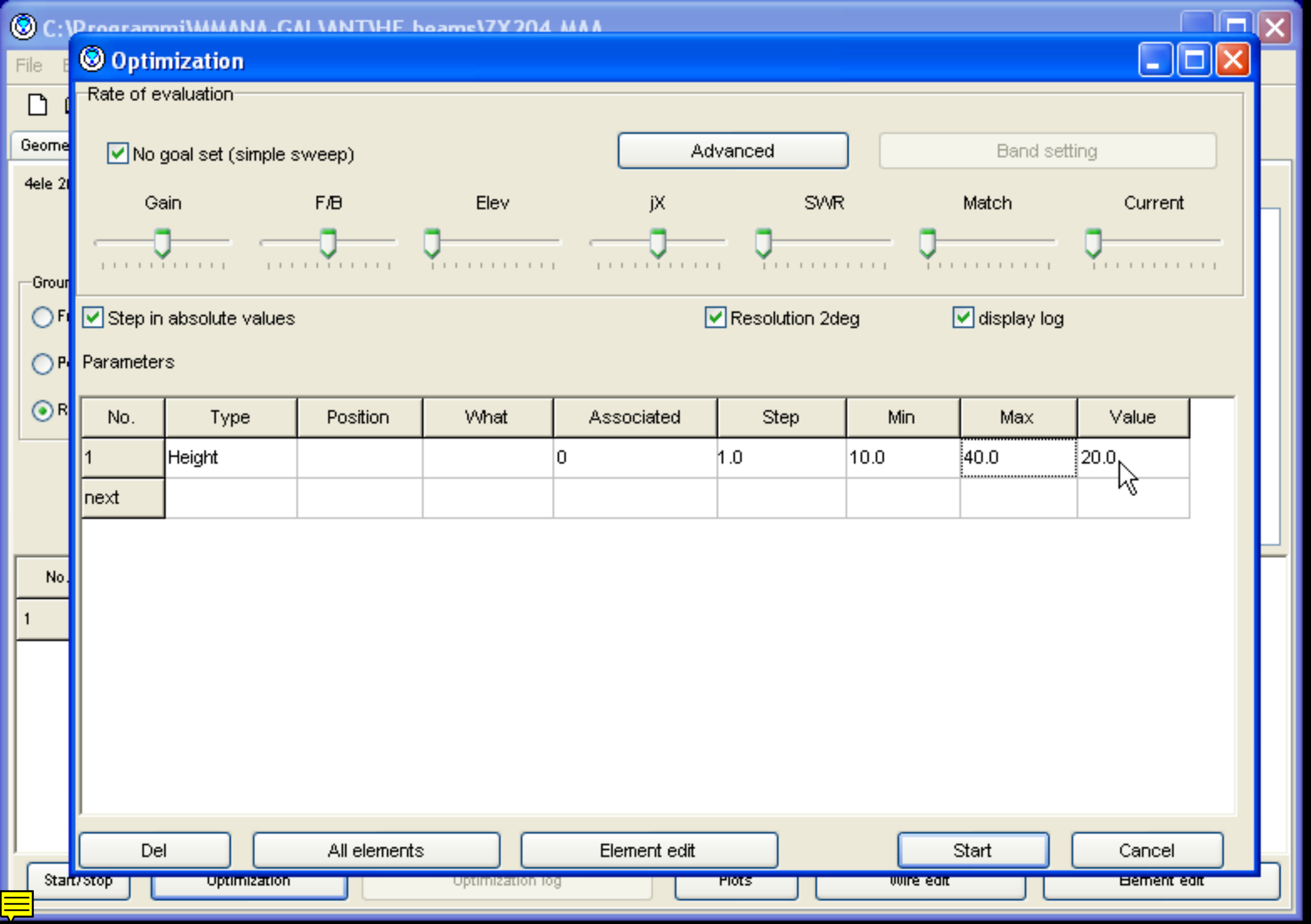
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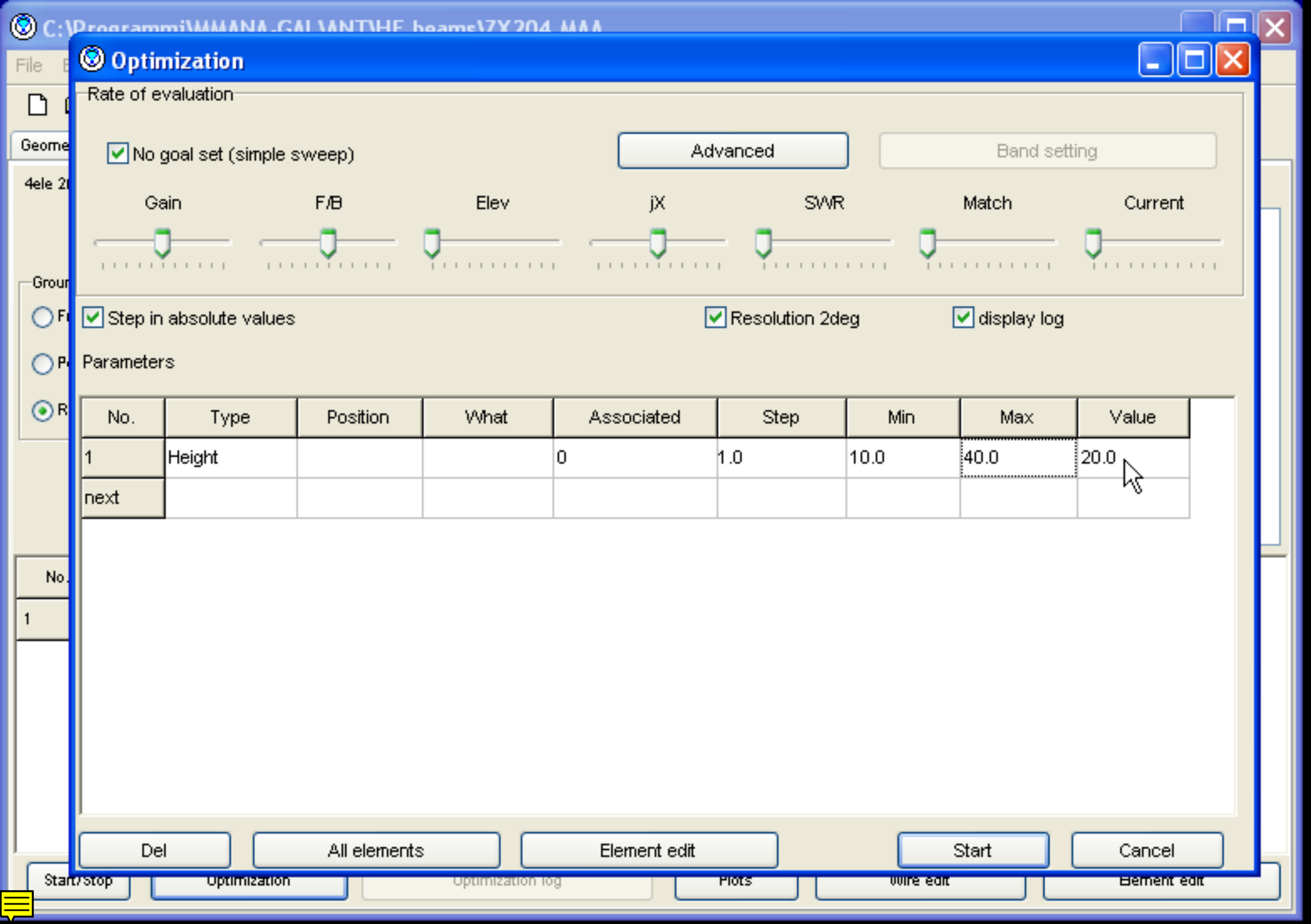
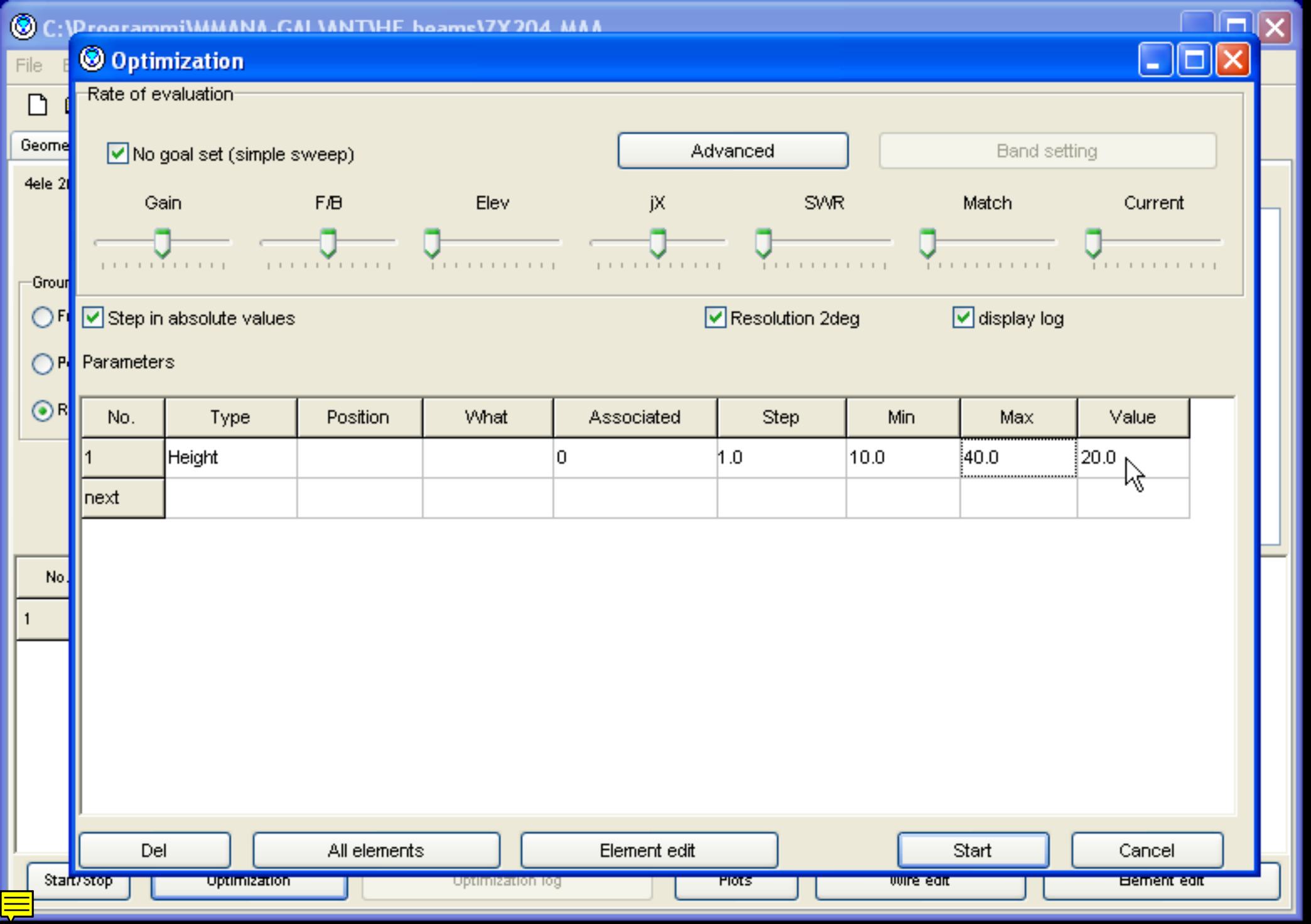
Associated
Step
Min
Max
Value
1
Height
0
1.0
10.0
40.0
20.0
next
Del
All elements
Element edit
Start
Cancel


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
1
Height
0
1.0
10.0
40.0
20.0
next
Del
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
1
Height
0
1.0
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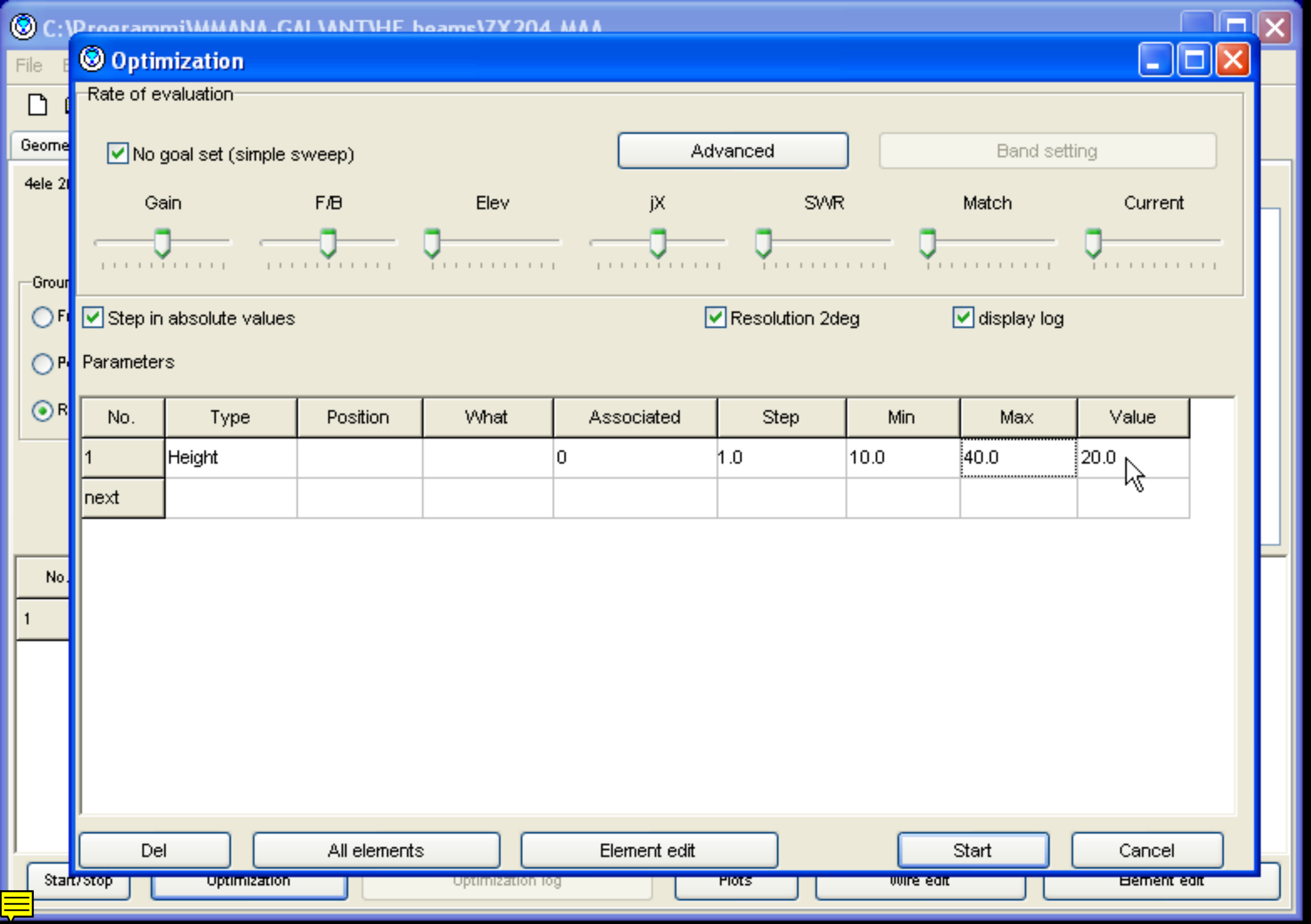
40.0
20.0
next
Del
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
1
Height
0
1.0
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20.0
next
Del
All elements
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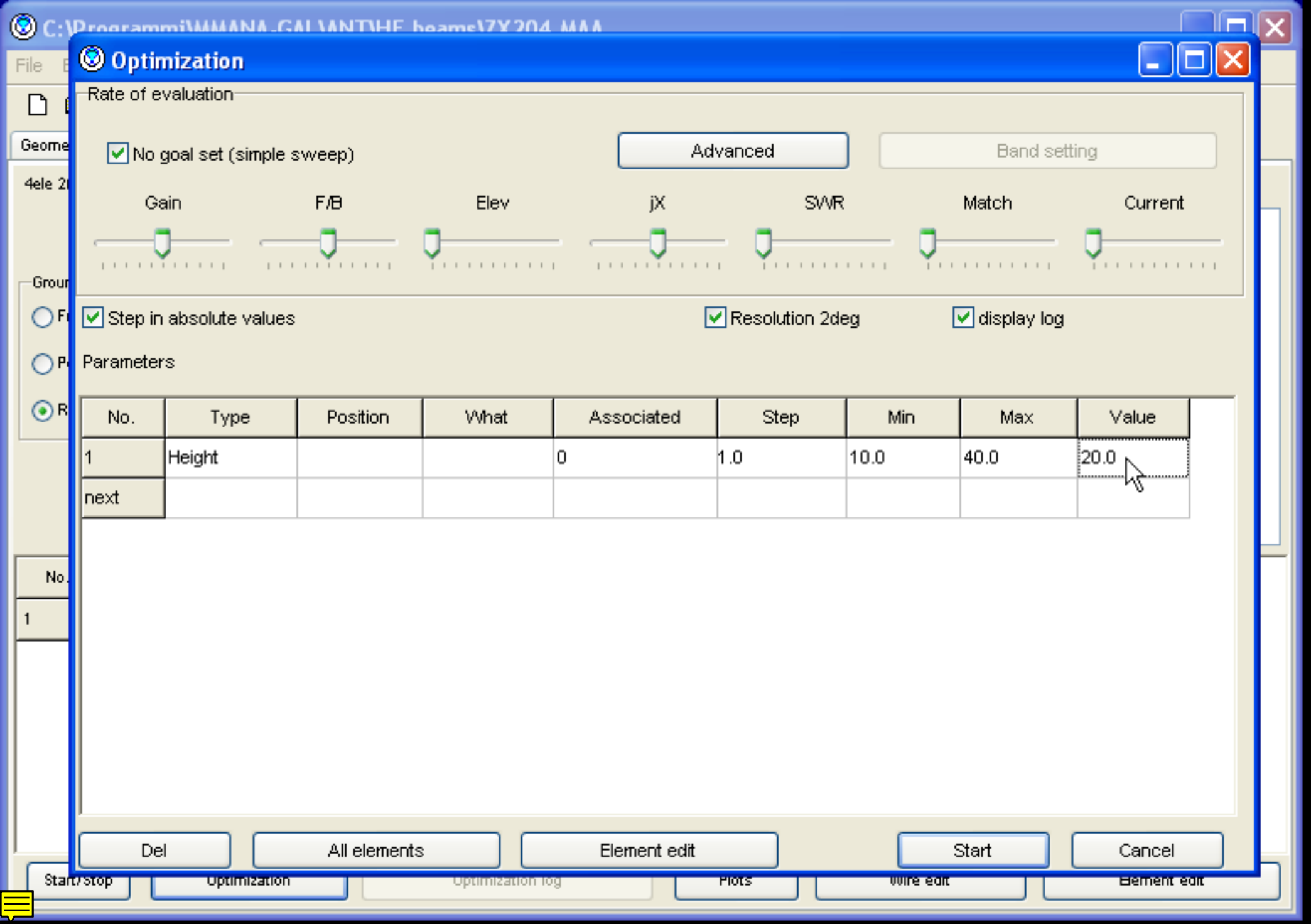
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
1
Height
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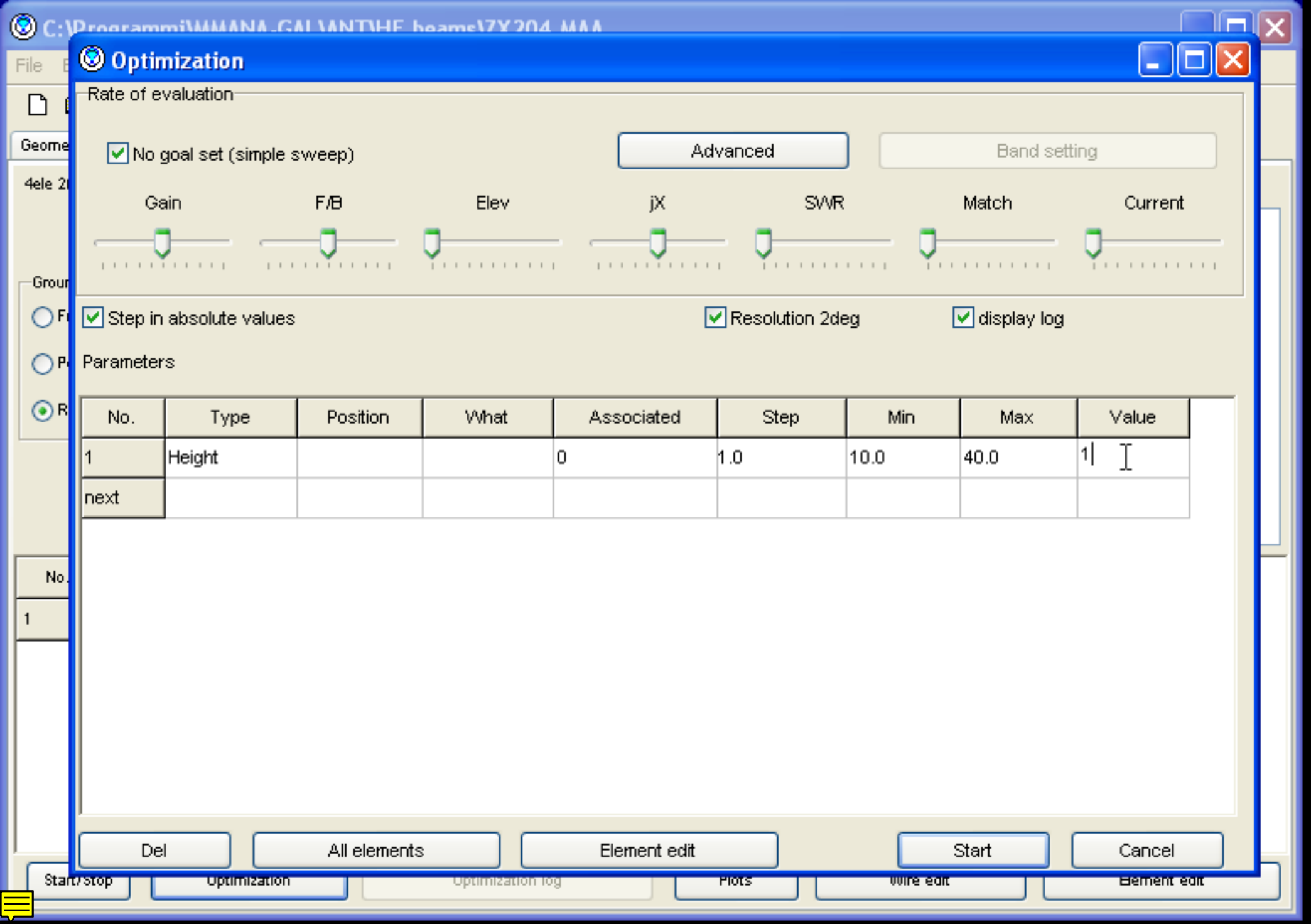
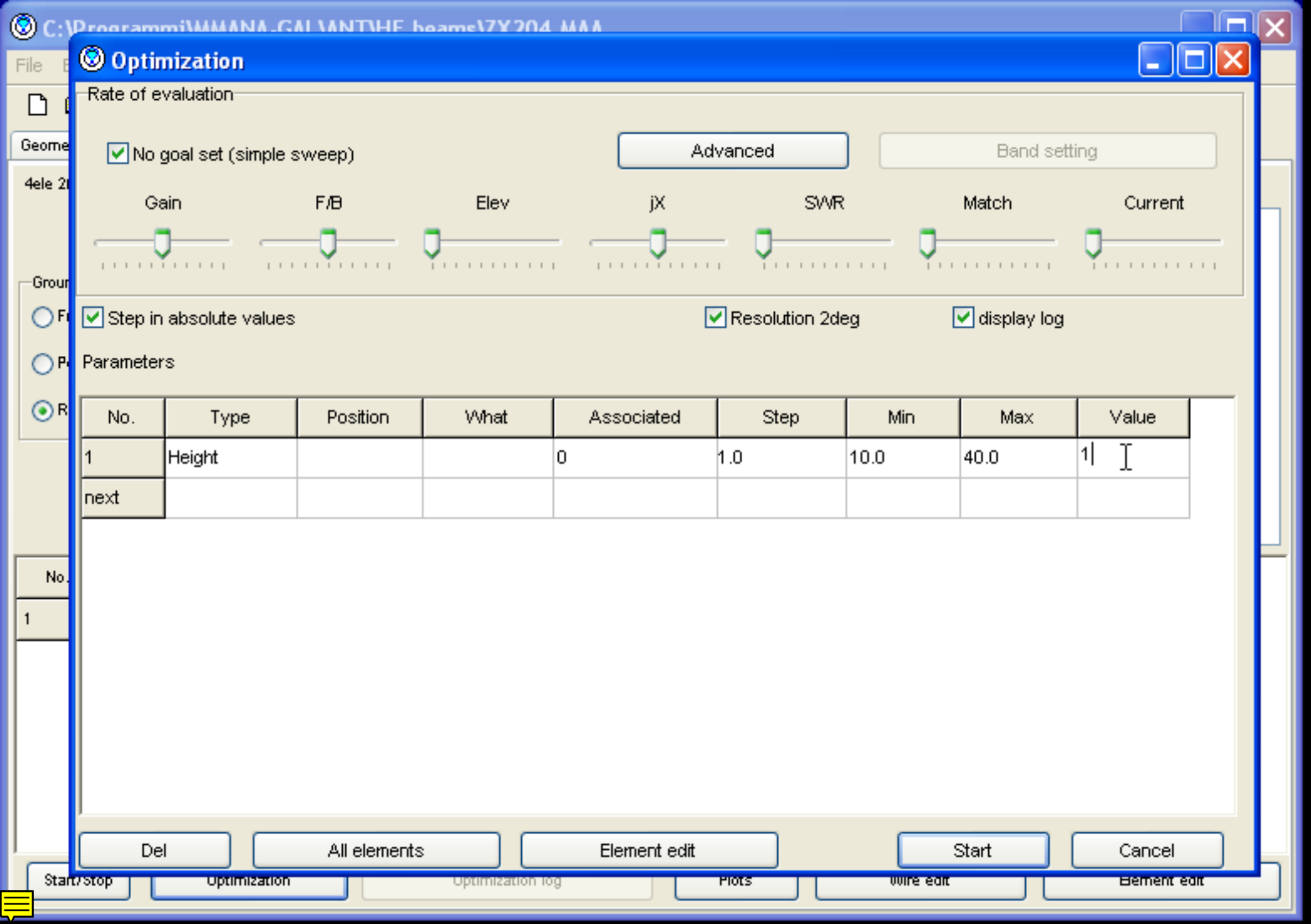
1.0
10.0
40.0
20.0
next
Del
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
1
Height
0
1.0
10.0
40.0
1
next
Del
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
1
Height
0
1.0
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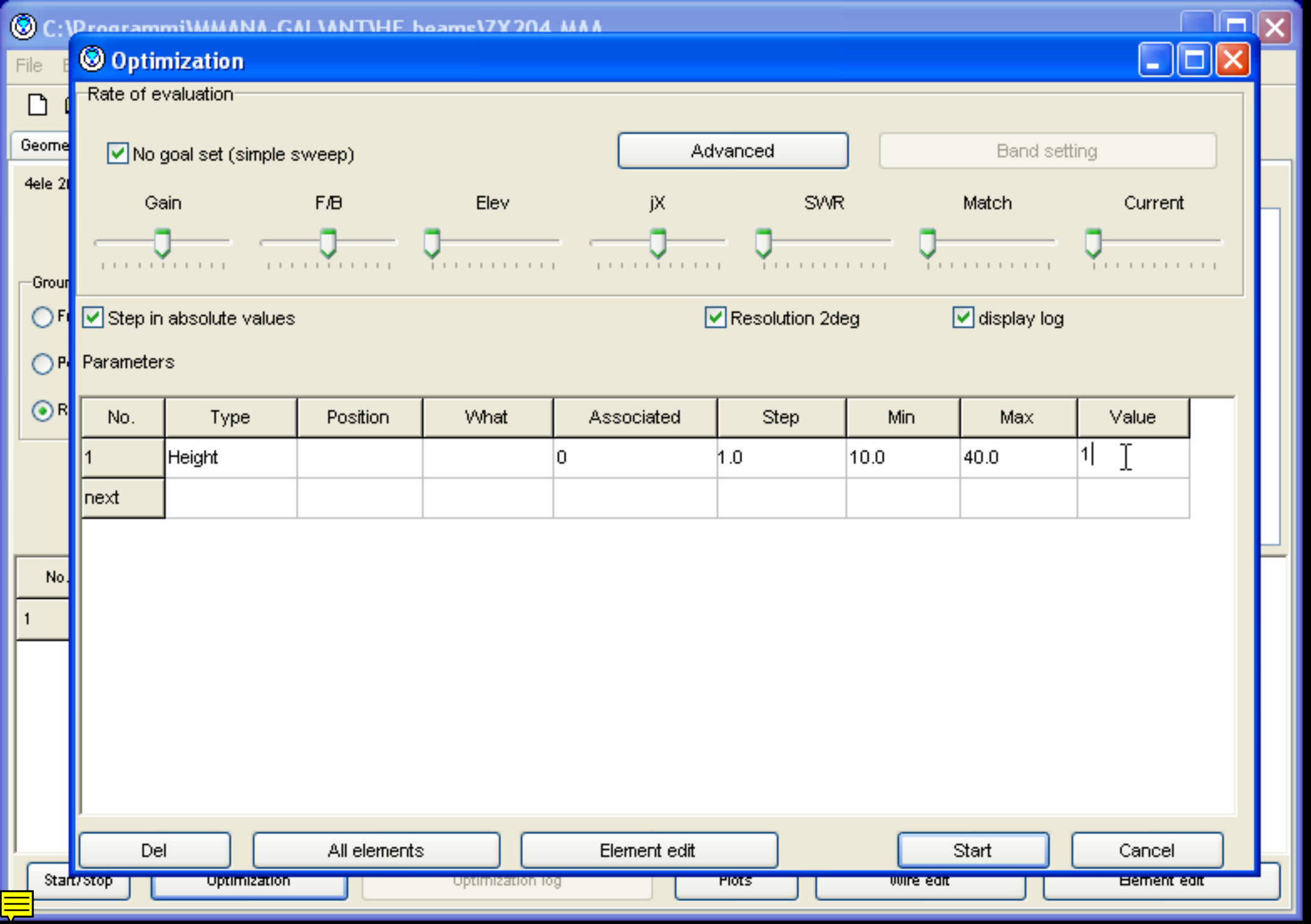
next
Del
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
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Height
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Del
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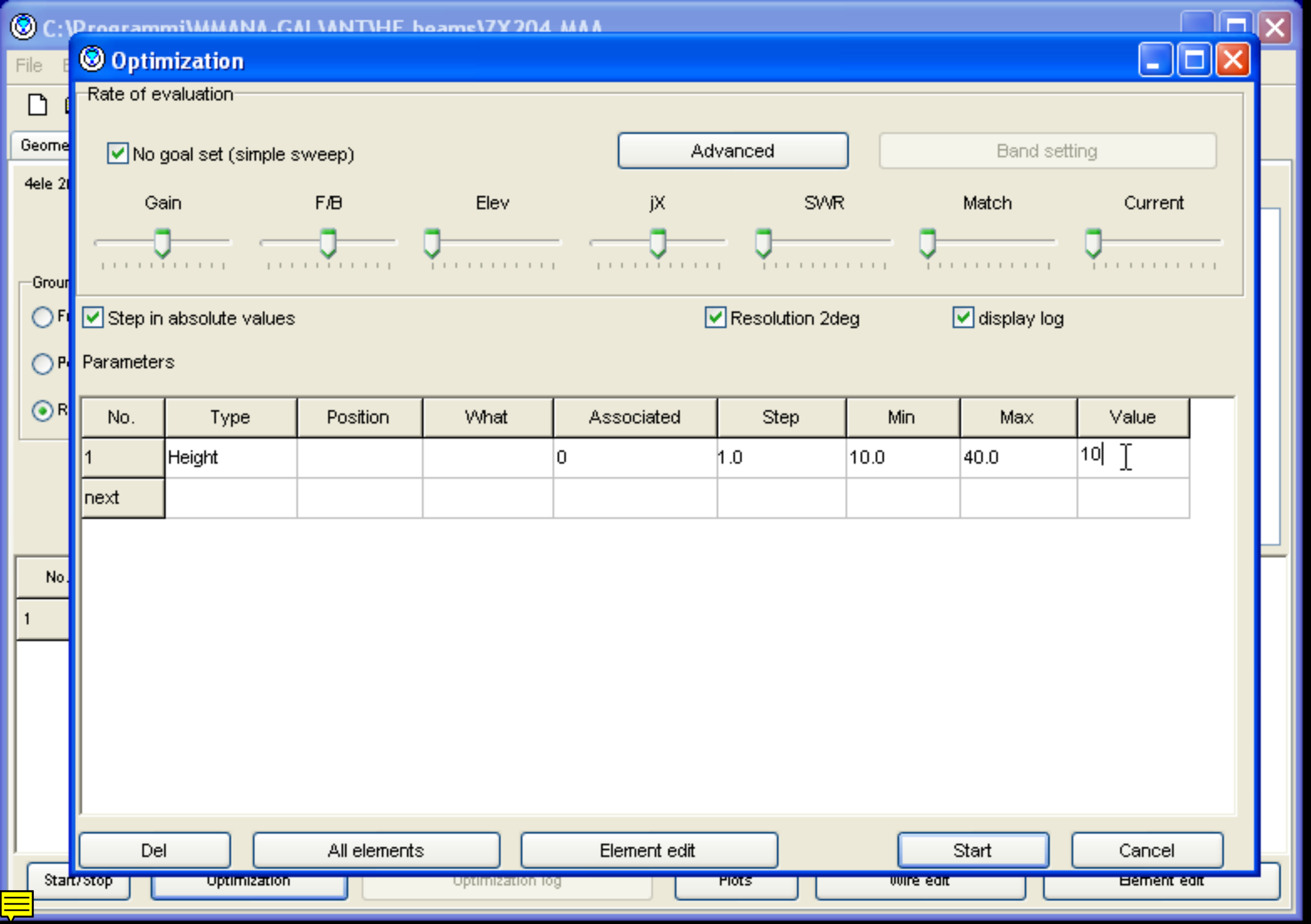
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
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Height
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1.0
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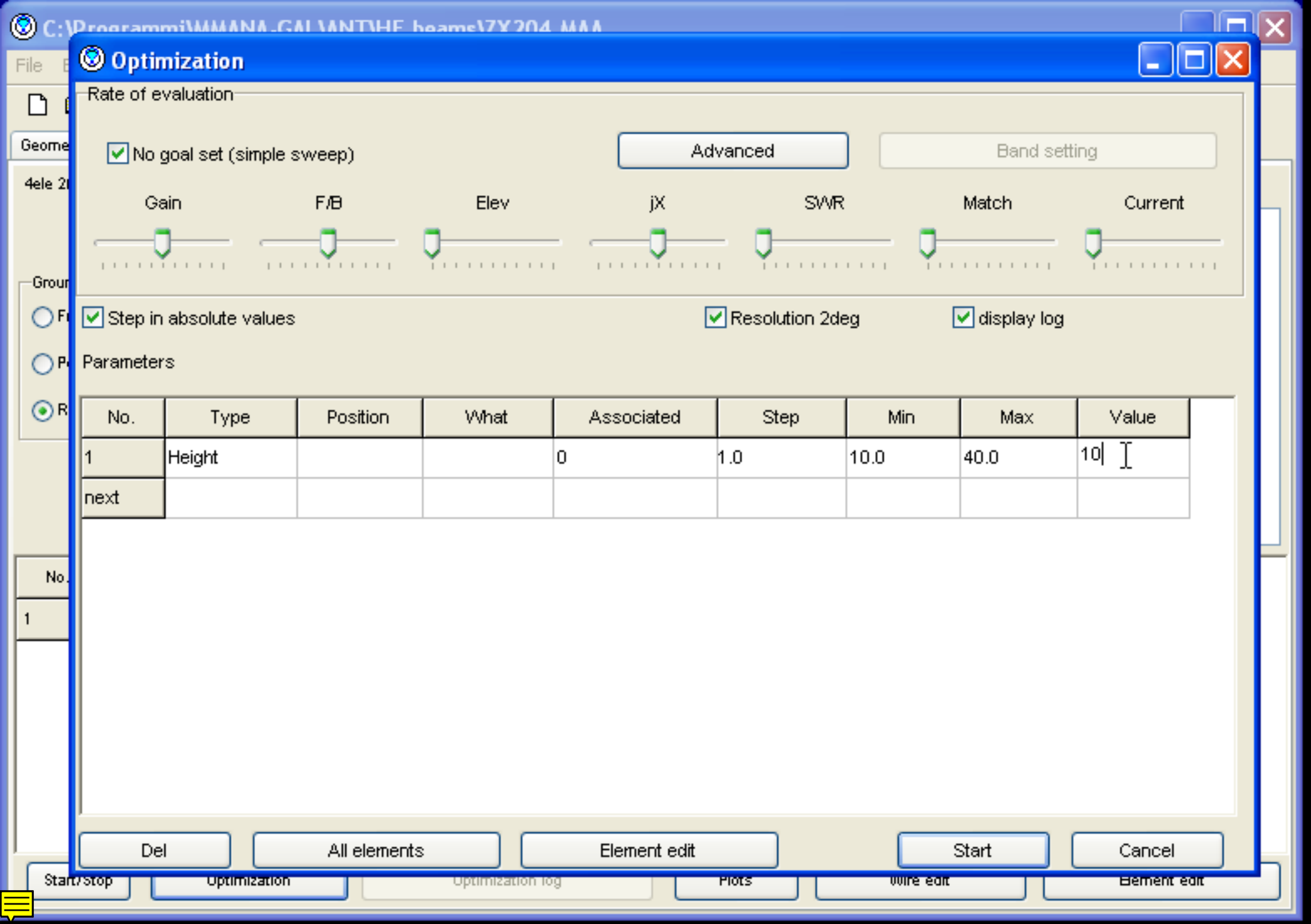
next
Del
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
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Height
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1.0
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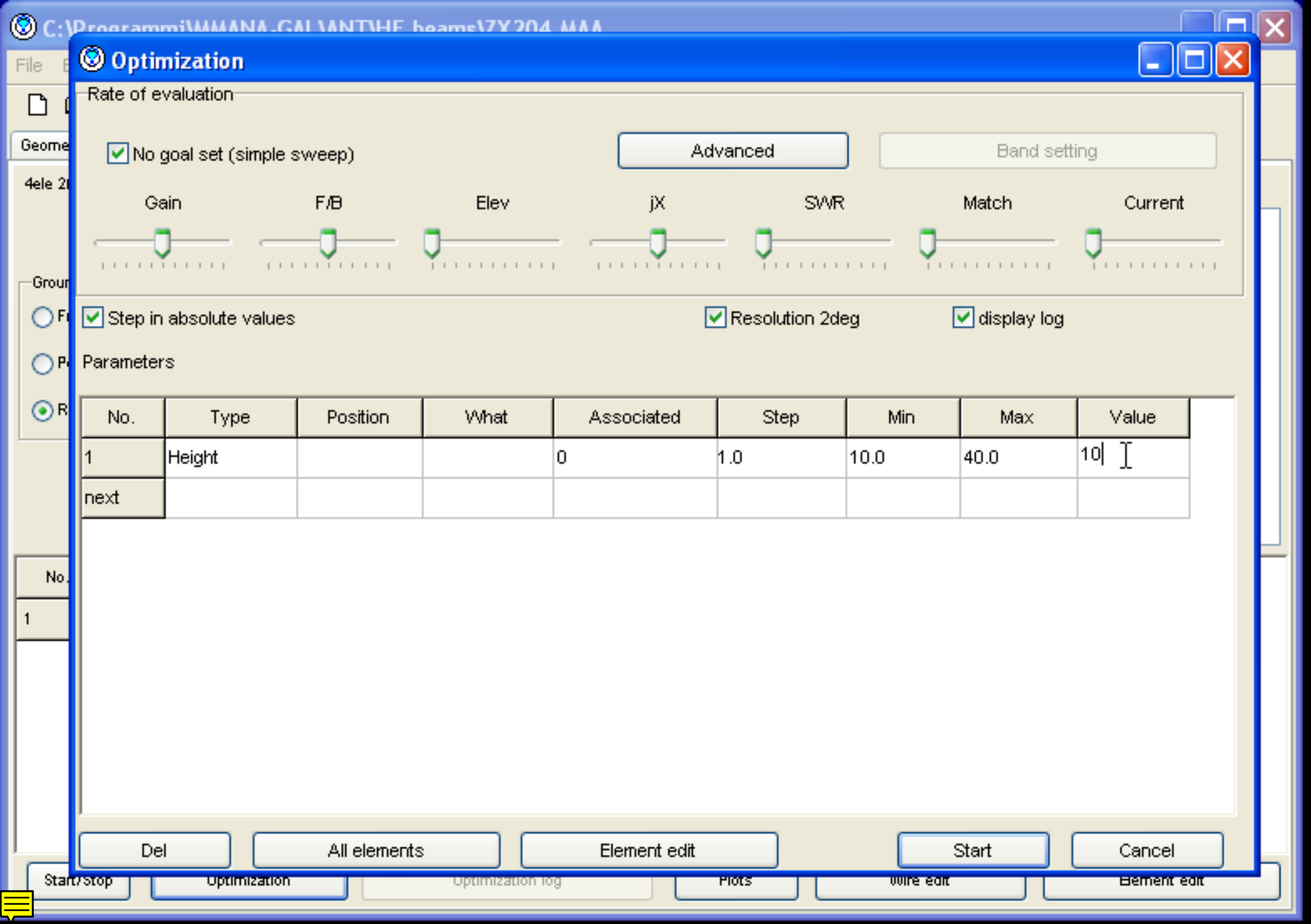
next
Del
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
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Height
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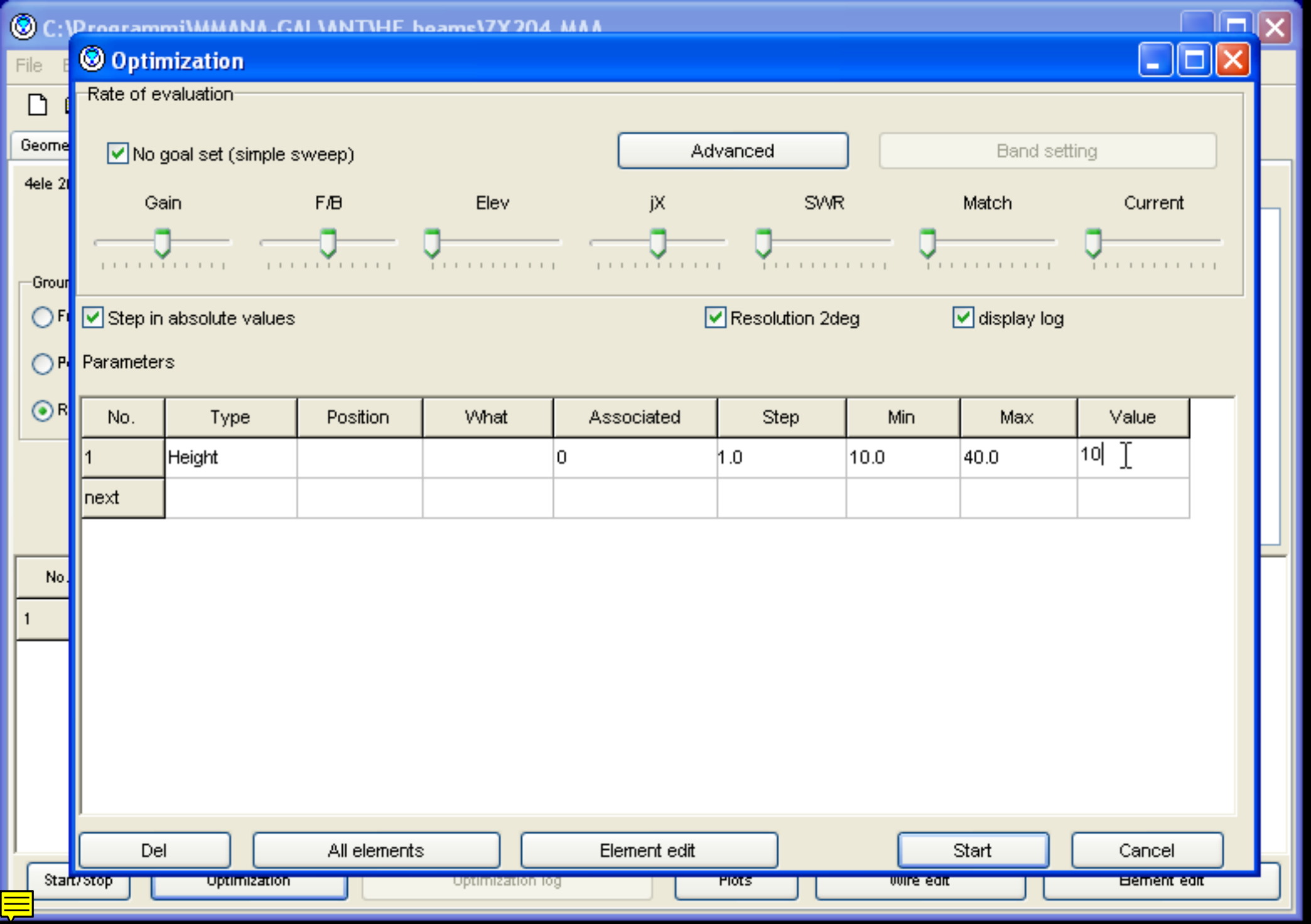
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
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SWR
Match
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Step in absolute values
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display log
Parameters
No.
Type
Position
What
Associated
Step
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Value
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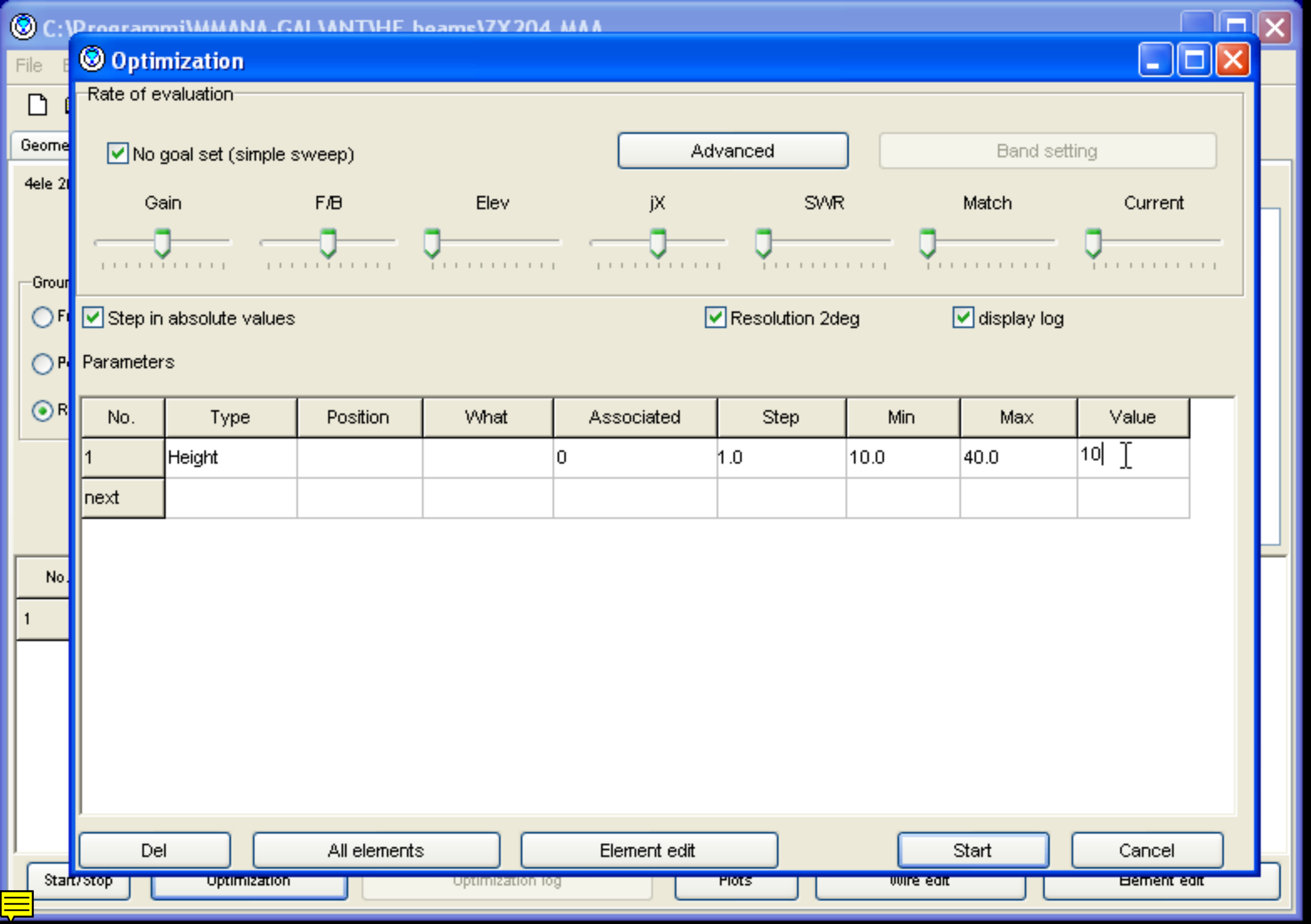
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
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SWR
Match
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Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
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All elements
Element edit
Start
Cancel
Start/Stop
Optimization
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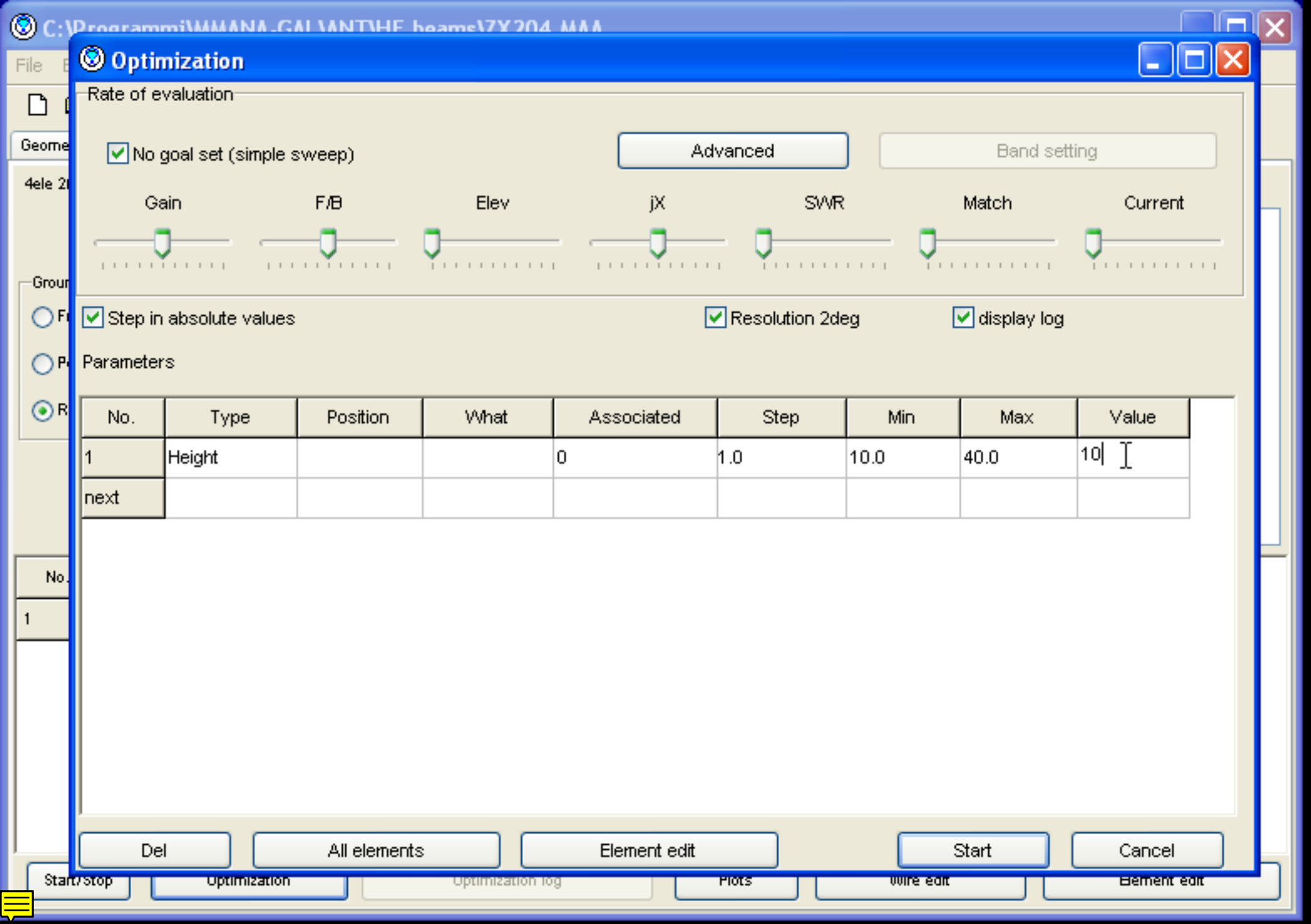
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
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SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
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Value
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Height
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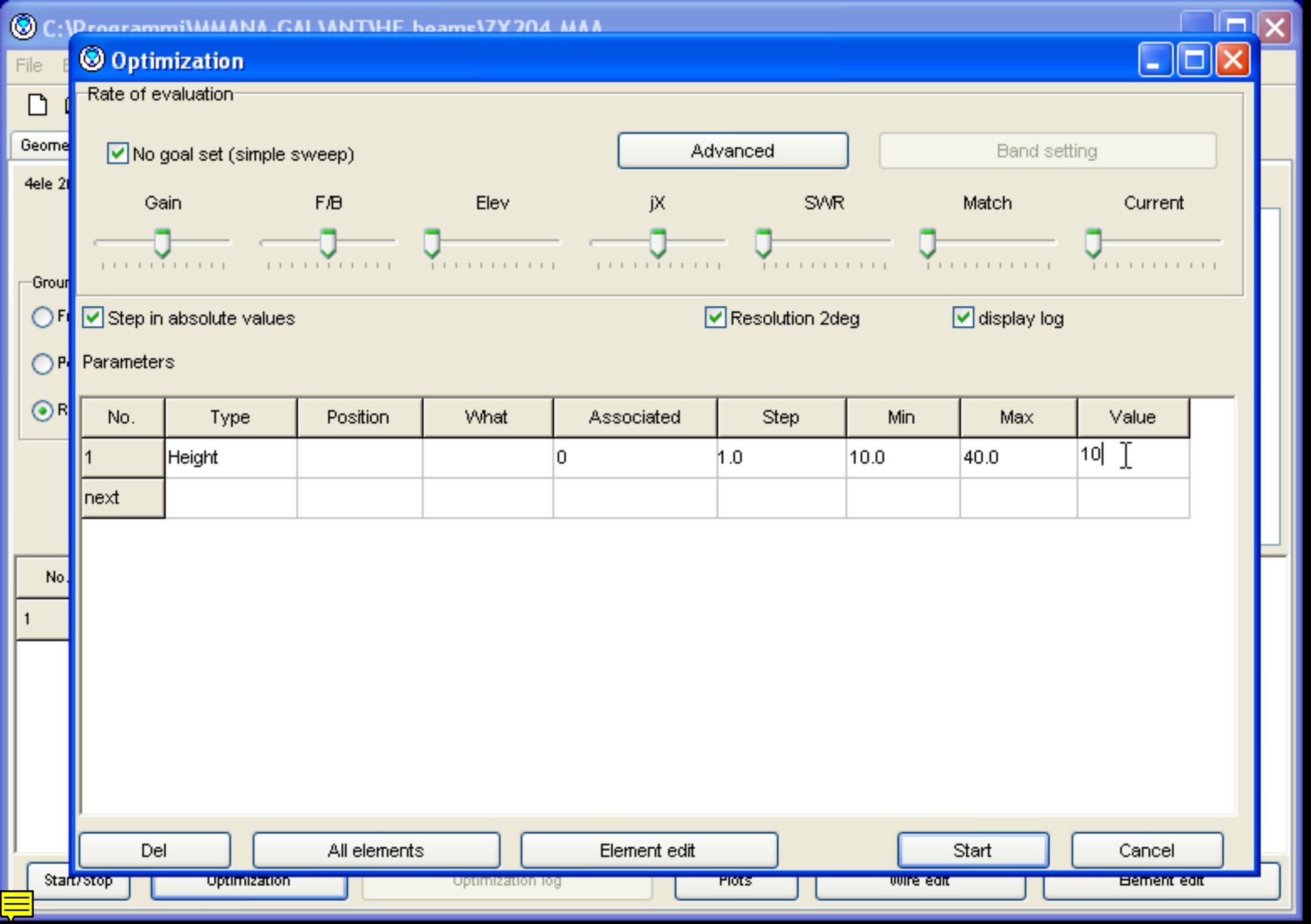
next
Del
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
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Height
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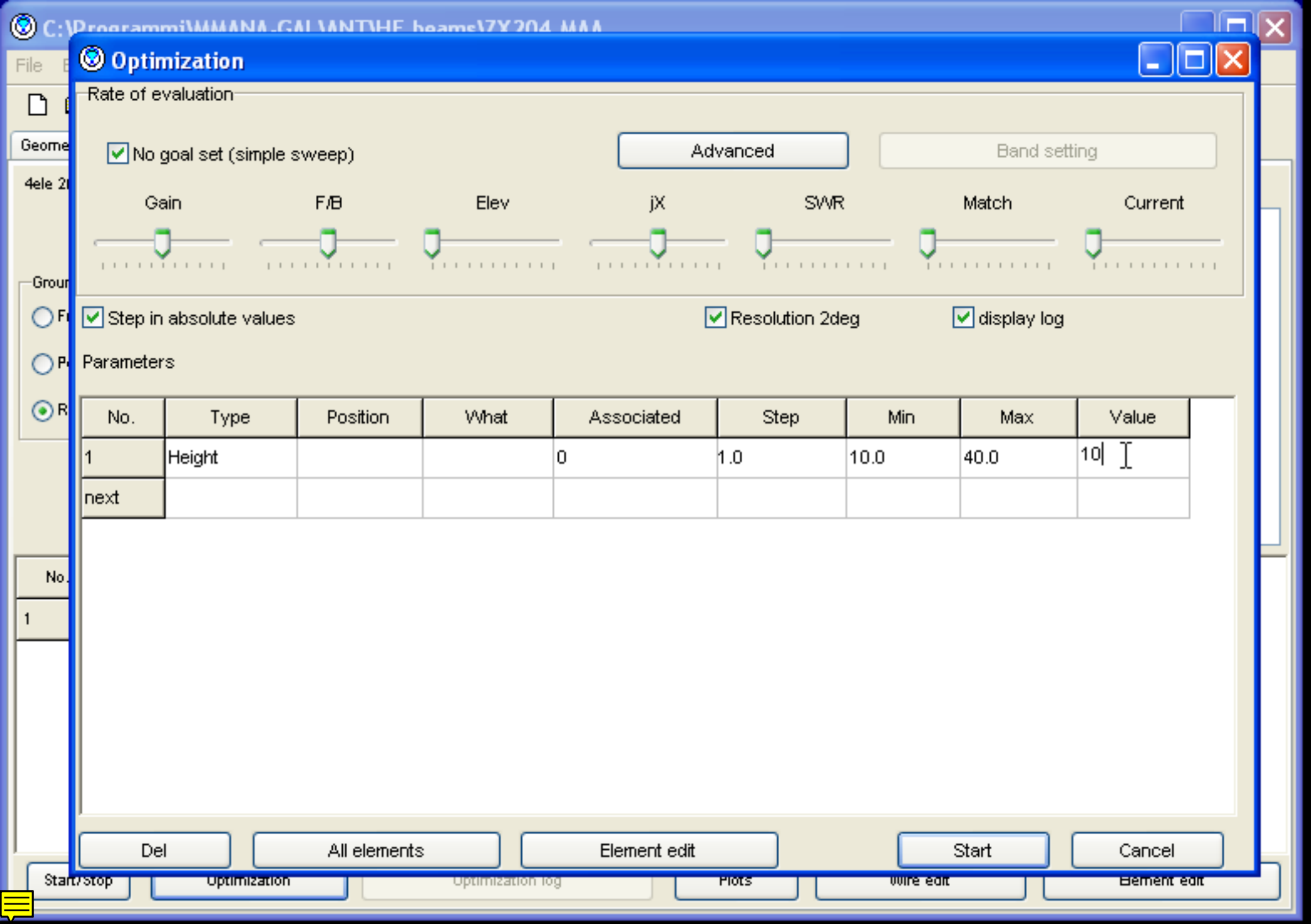
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
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Max
Value
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Height
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All elements
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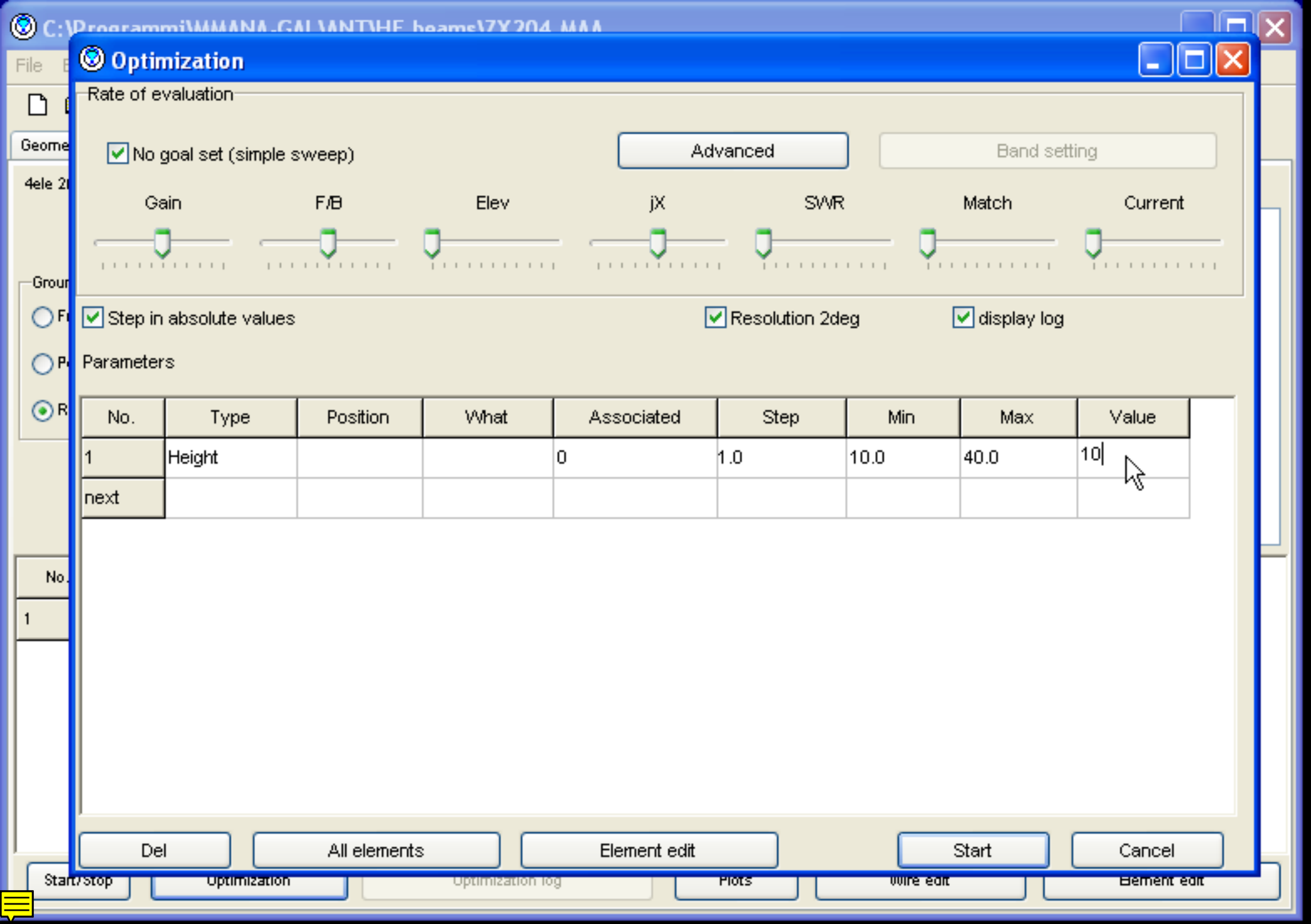
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
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next
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Element edit
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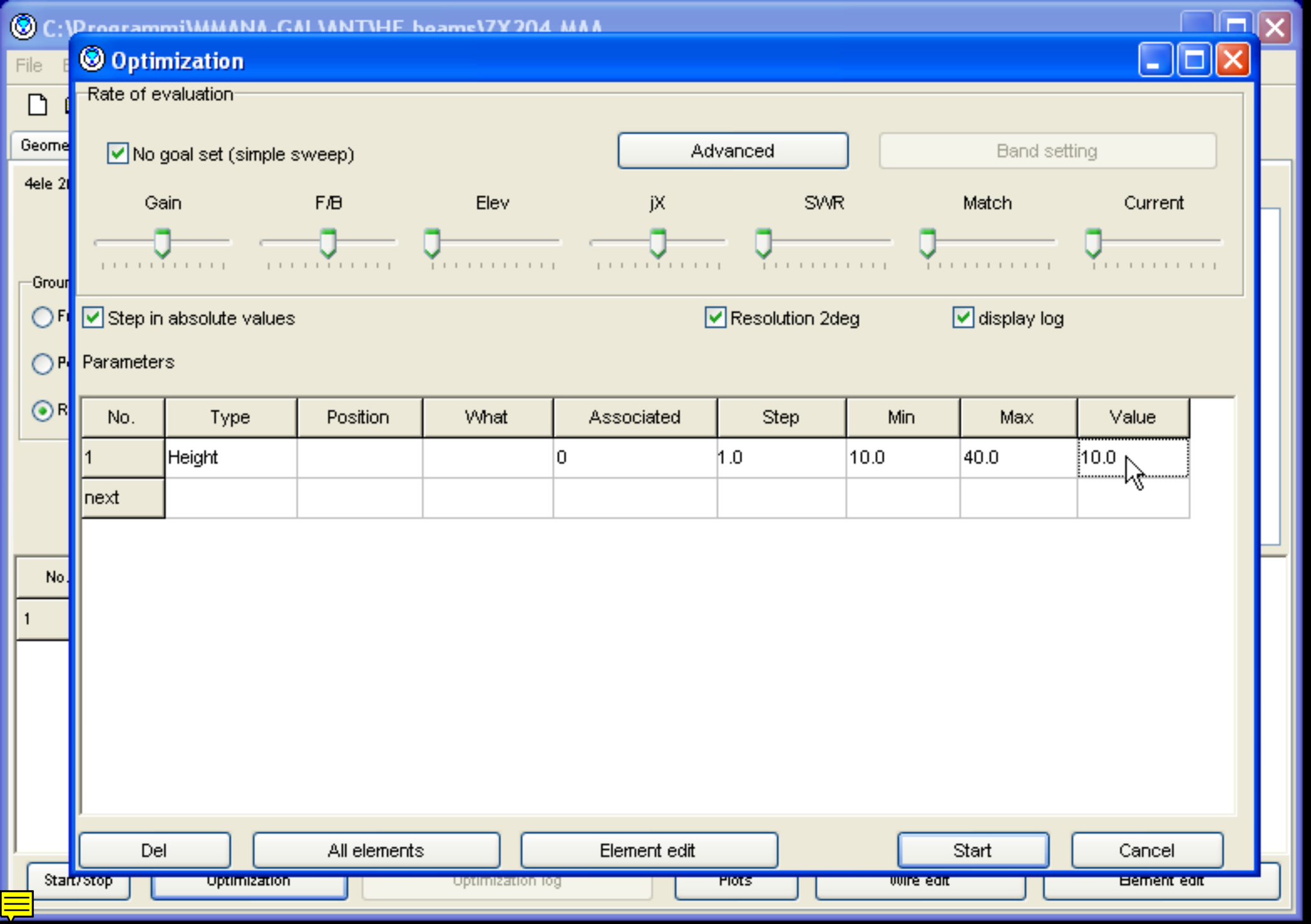
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
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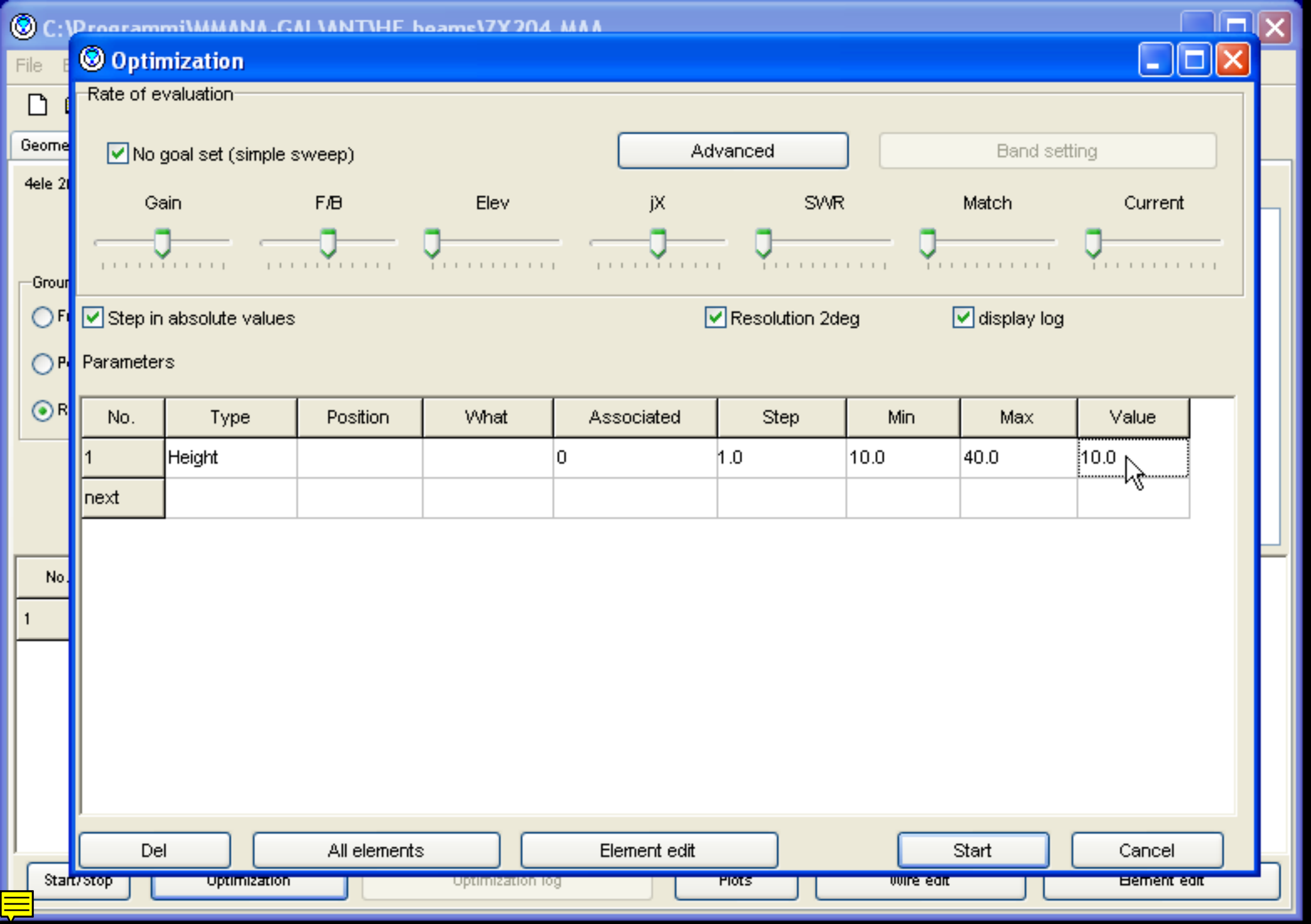
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
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Value
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Height
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next
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All elements
Element edit
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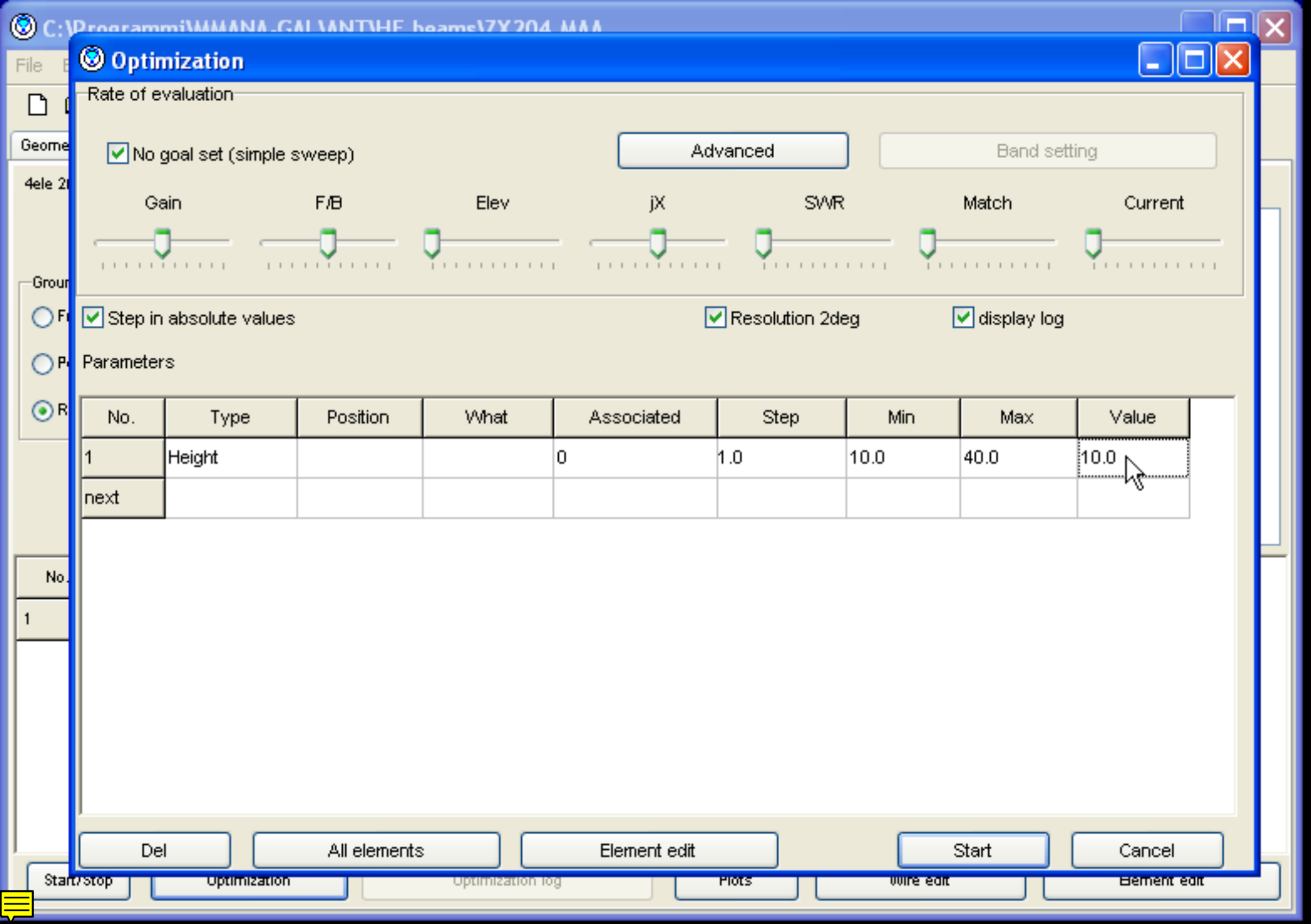
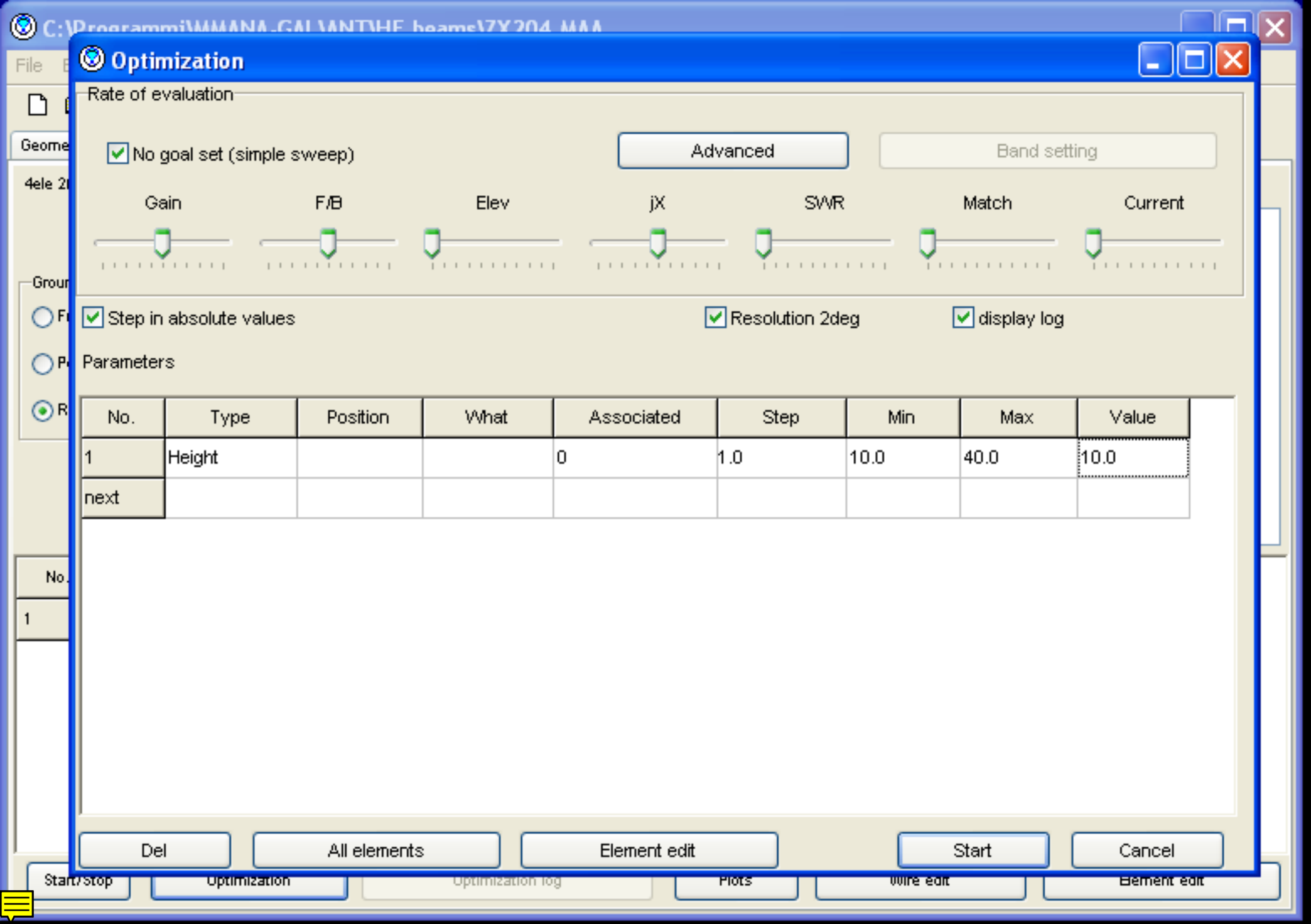
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
1
Height
0
1.0
10.0
40.0
10.0
next
Del
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
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Height
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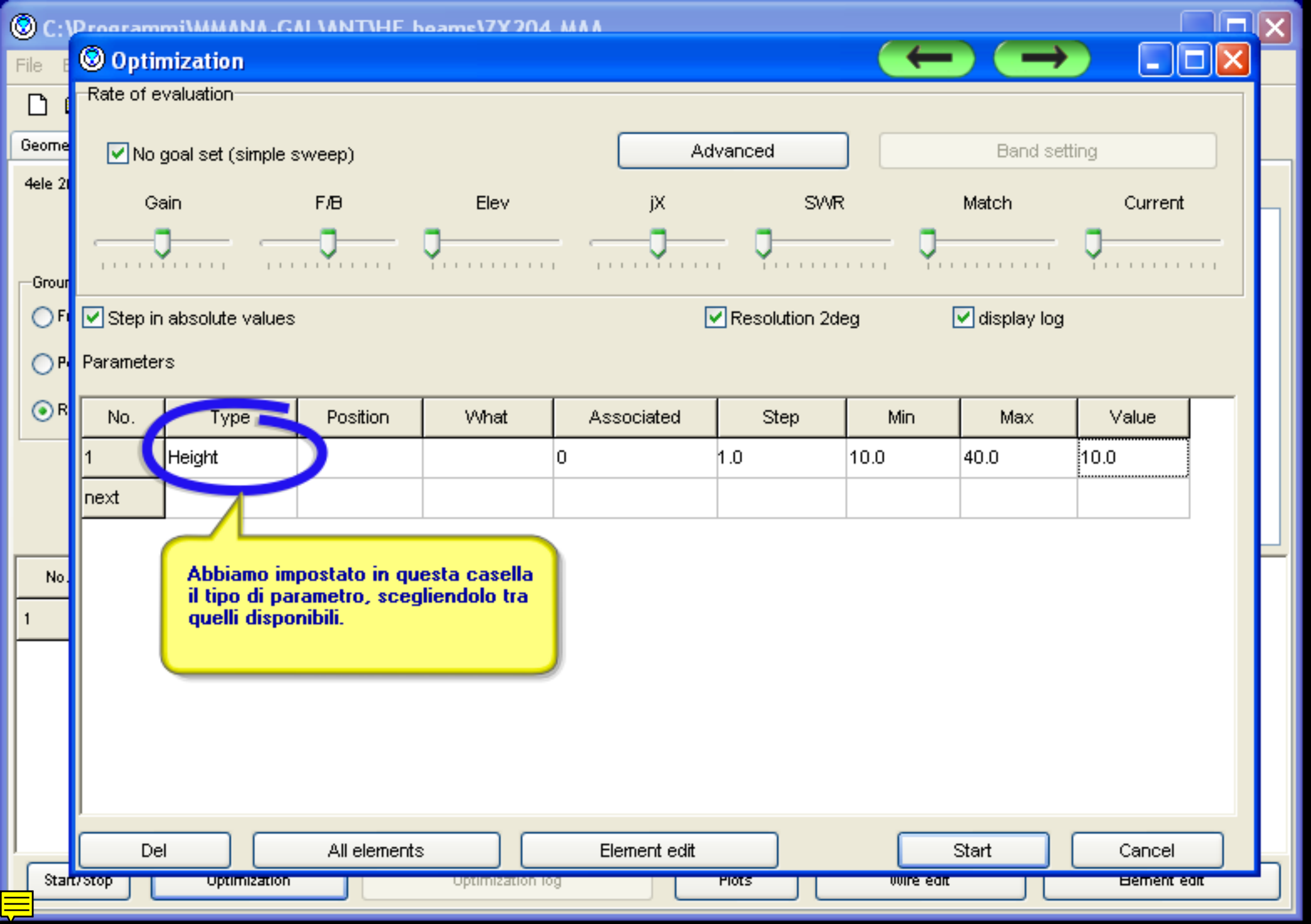
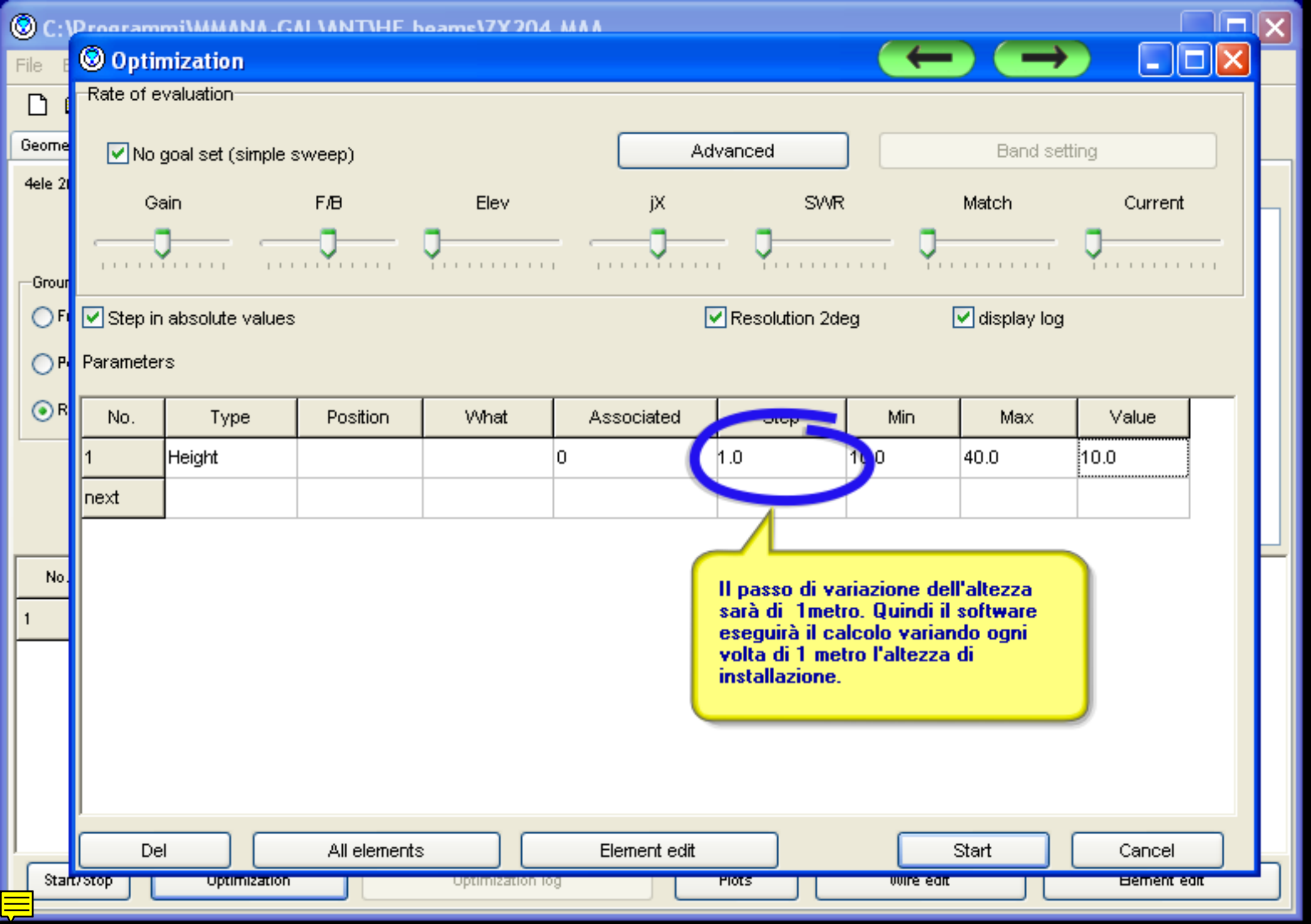
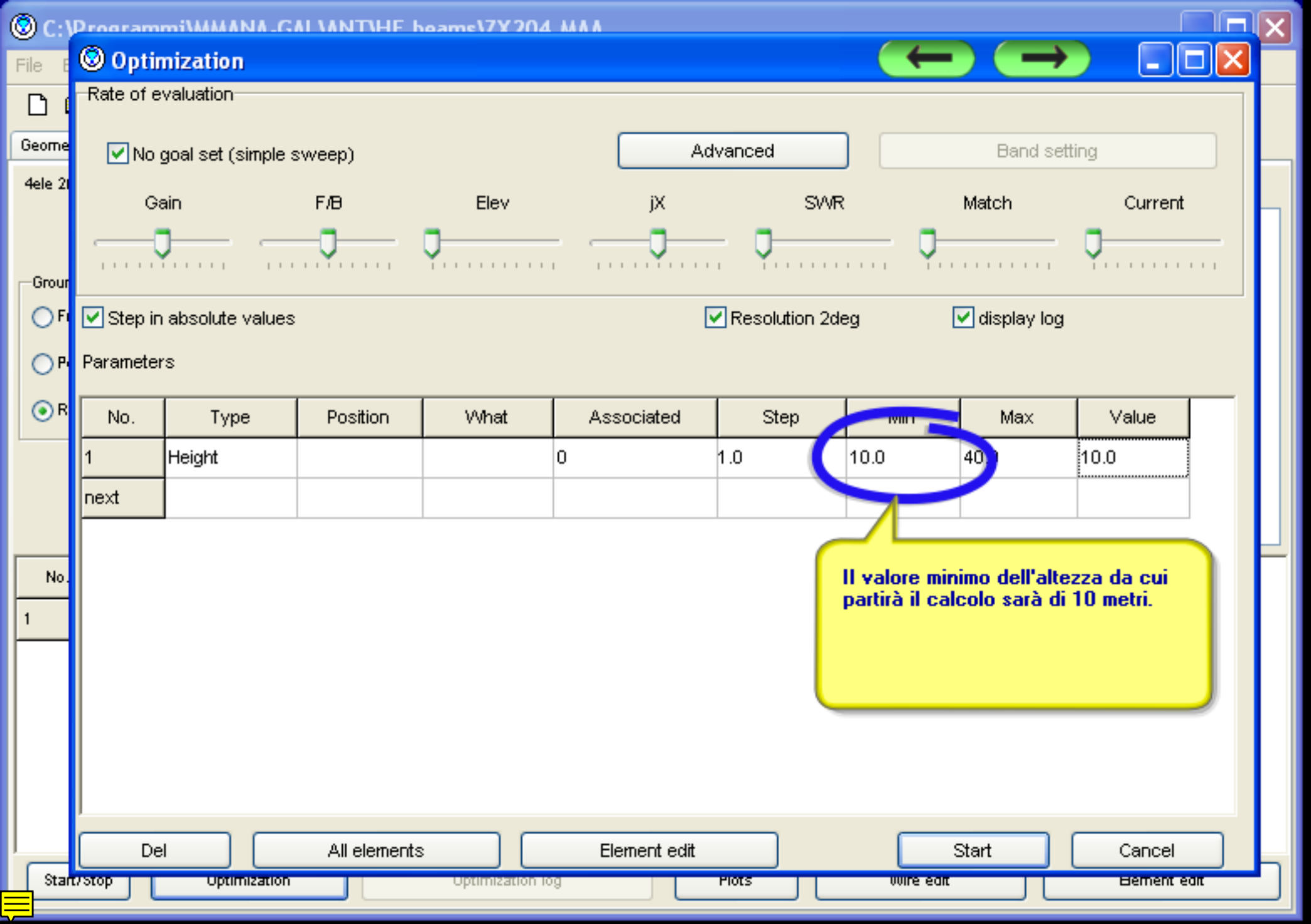
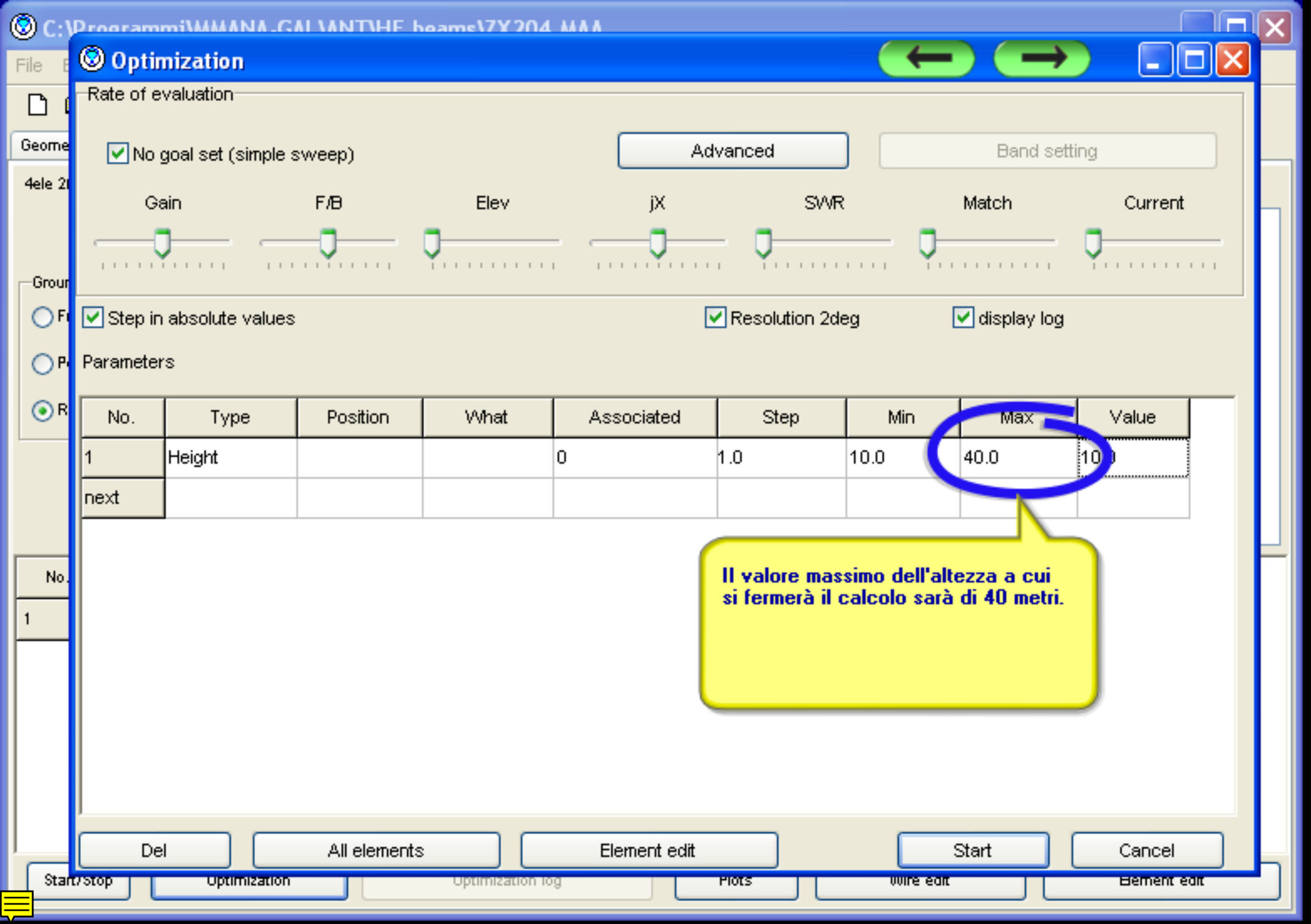
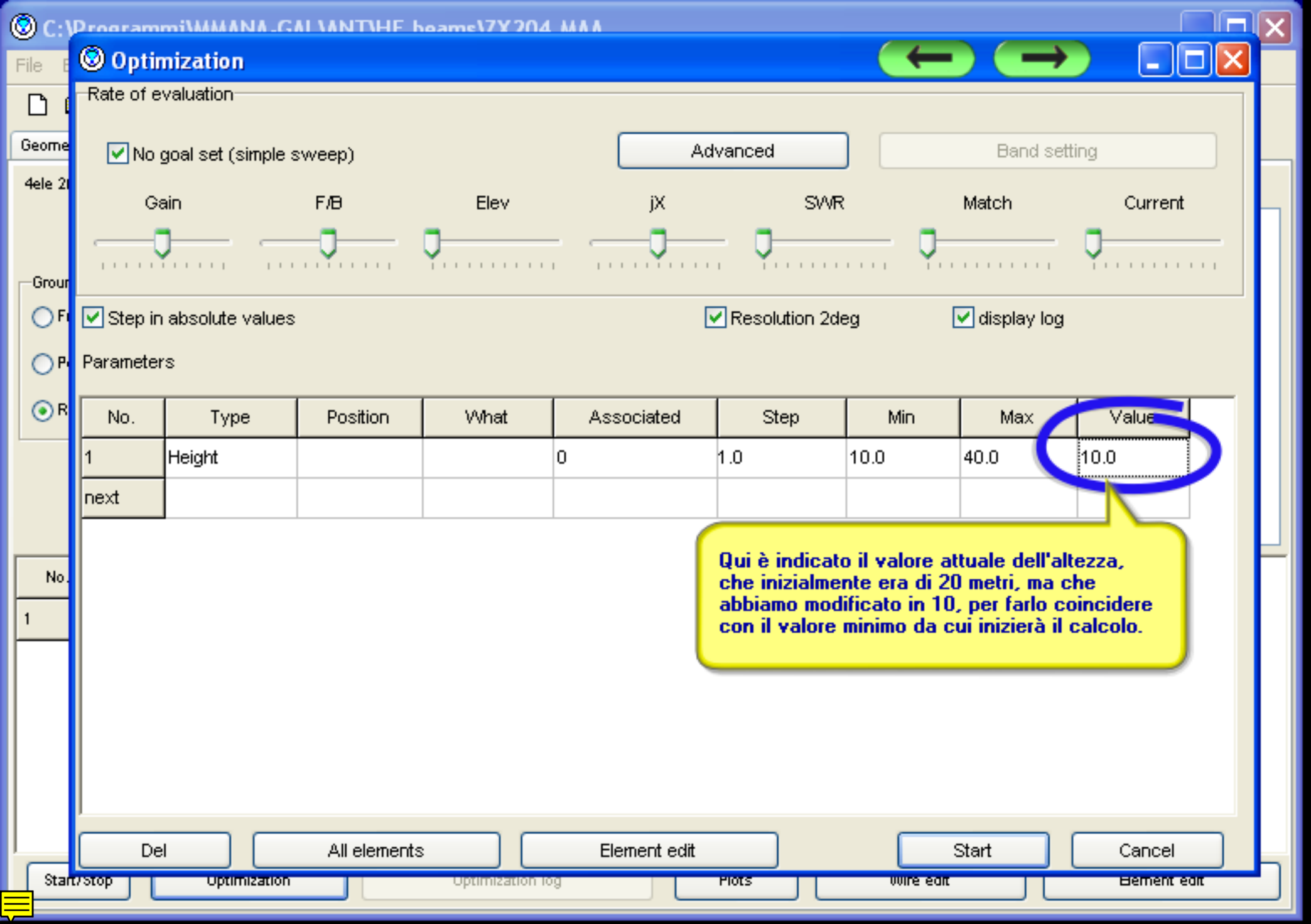
1.0
10.0
40.0
10.0
next
Del
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit

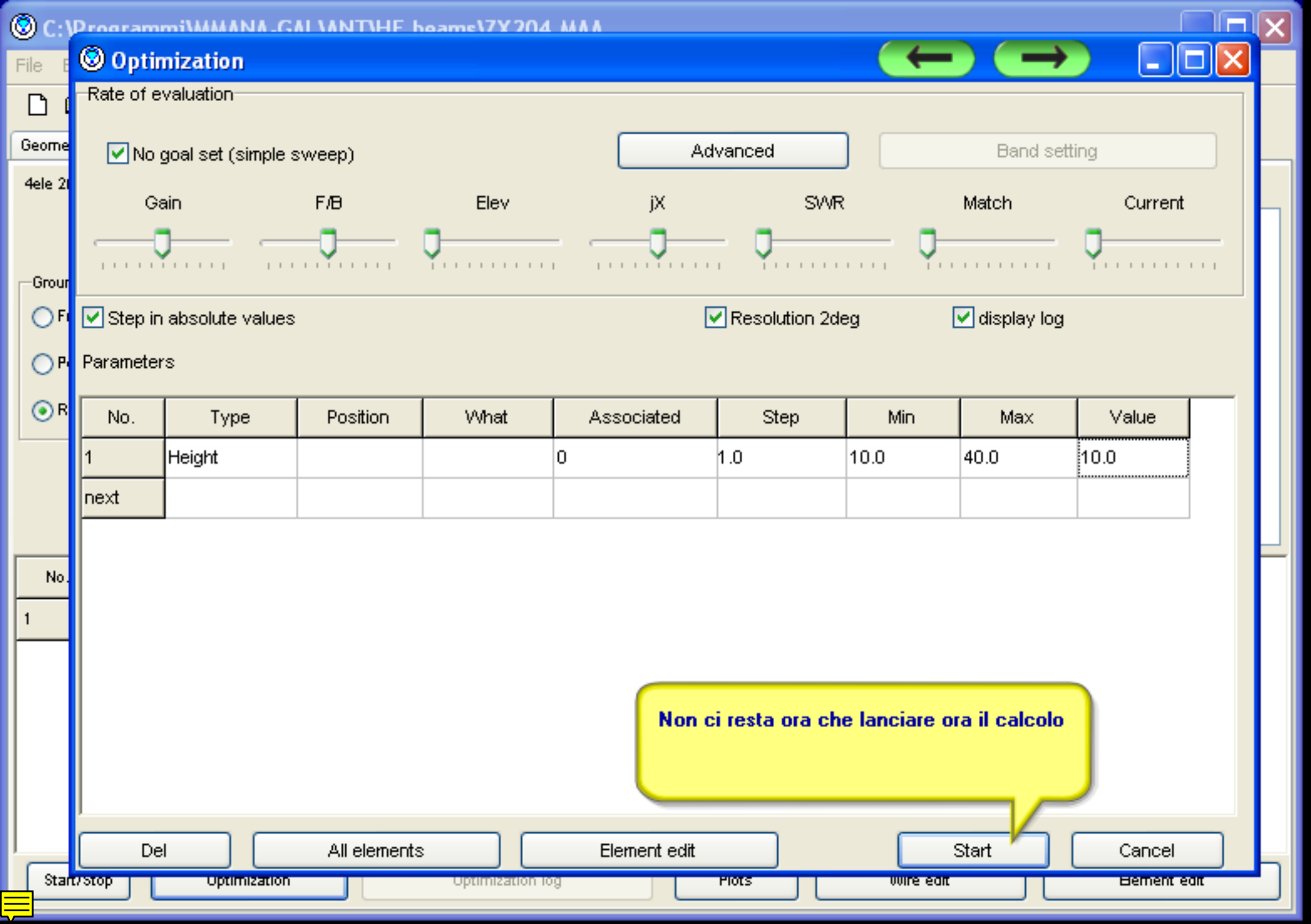

Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
1
Height
0
1.0
10.0
40.0
10.0
next
Abbiamo impostato in questa casella il tipo di parametro, scegliendolo tra quelli disponibili.
Del
All elements
Element edit
Start
Cancel

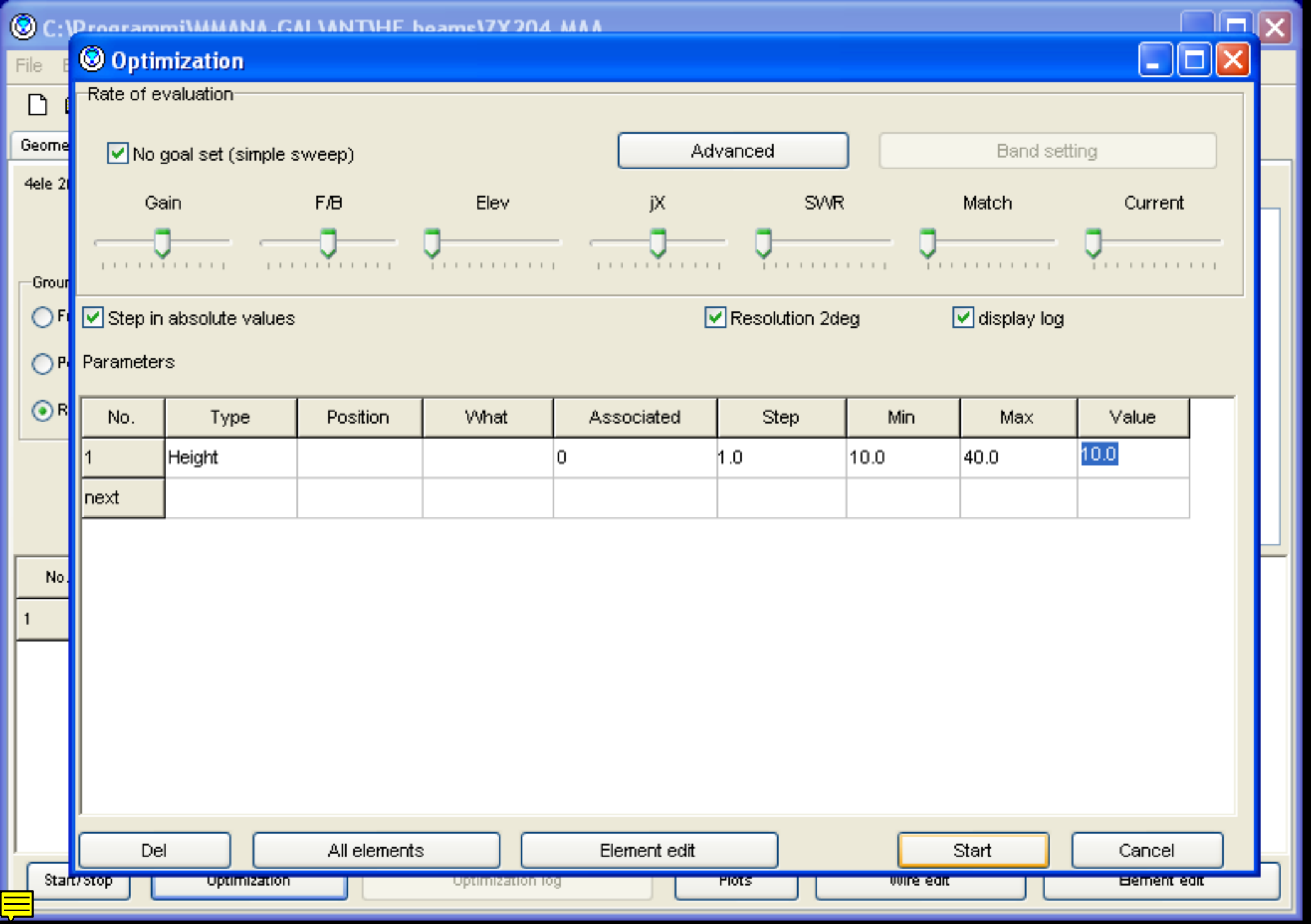

Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
1
Height
0
1.0
10.0
40.0
10.0
next
Il passo di variazione dell'altezza sarà di 1metro. Quindi il software eseguirà il calcolo variando ogni volta di 1 metro l'altezza di installazione.
Del
All elements
Element edit
Start
Cancel

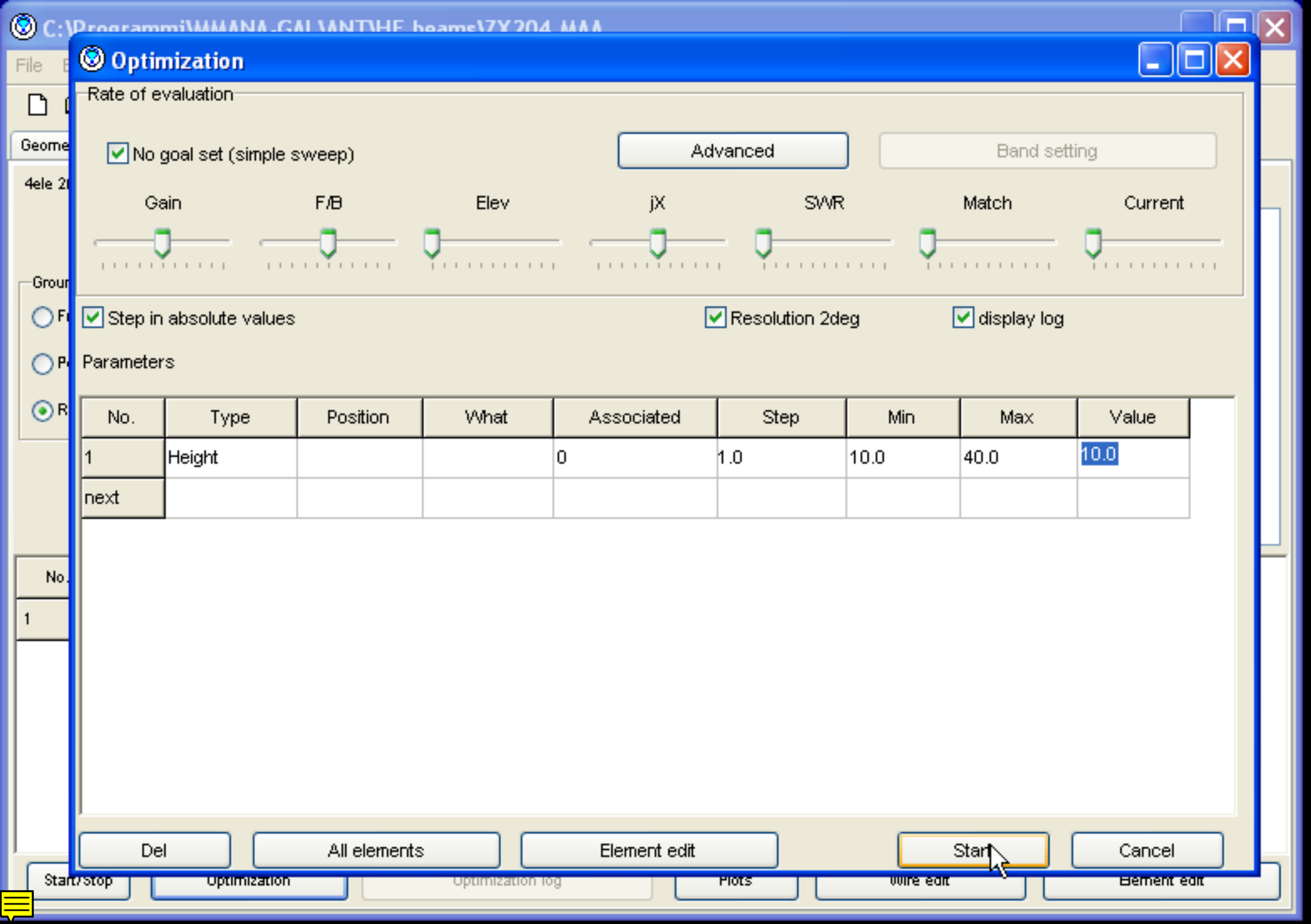

Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
1
Height
0
1.0
10.0
10.0
next
Il valore minimo dell'altezza da cui partirà il calcolo sarà di 10 metri.
Del
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit

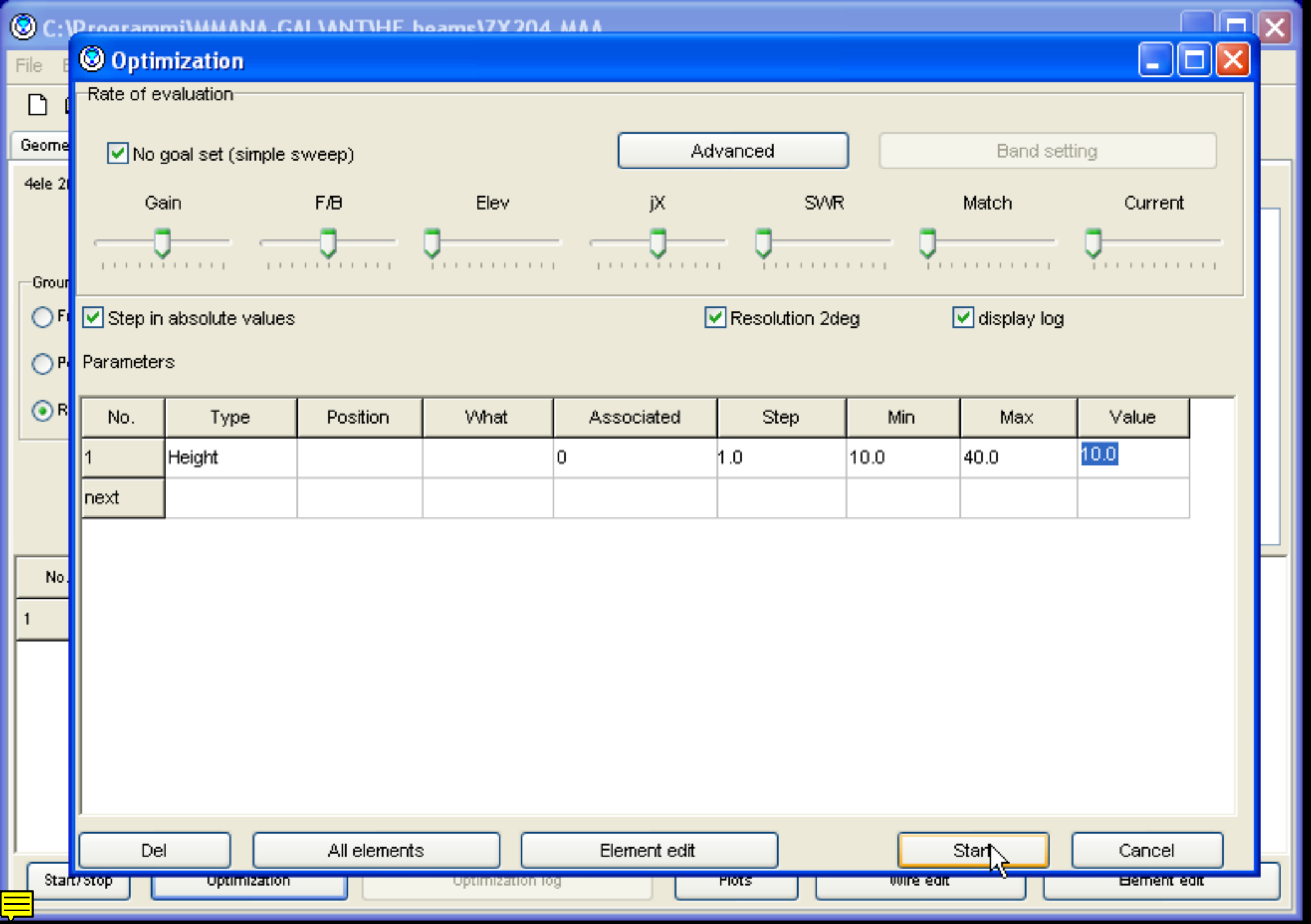

Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
1
Height
0
1.0
10.0
40.0
next
Il valore massimo dell'altezza a cui si fermerà il calcolo sarà di 40 metri.
Del
All elements
Element edit
Start
Cancel


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
1
Height
0
1.0
10.0
40.0
10.0
next
Qui è indicato il valore attuale dell'altezza, che inizialmente era di 20 metri, ma che abbiamo modificato in 10, per farlo coincidere con il valore minimo da cui inizierà il calcolo.
Del
All elements
Element edit
Start
Cancel


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
1
Height
0
1.0
10.0
40.0
10.0
next
Non ci resta ora che lanciare ora il calcolo
Del
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
1
Height
0
1.0
10.0
40.0
10.0
next
Del
All elements
Element edit
Start
Cancel


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
1
Height
0
1.0
10.0
40.0
10.0
next
Del
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit


Optimization
Rate of evaluation
No goal set (simple sweep)
Advanced
Band setting
Gain
F/B
Elev
jX
SWR
Match
Current
Step in absolute values
Resolution 2deg
display log
Parameters
No.
Type
Position
What
Associated
Step
Min
Max
Value
1
Height
0
1.0
10.0
40.0
10.0
next
Del
All elements
Element edit
Start
Cancel
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit

C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

Add height 10.00 m

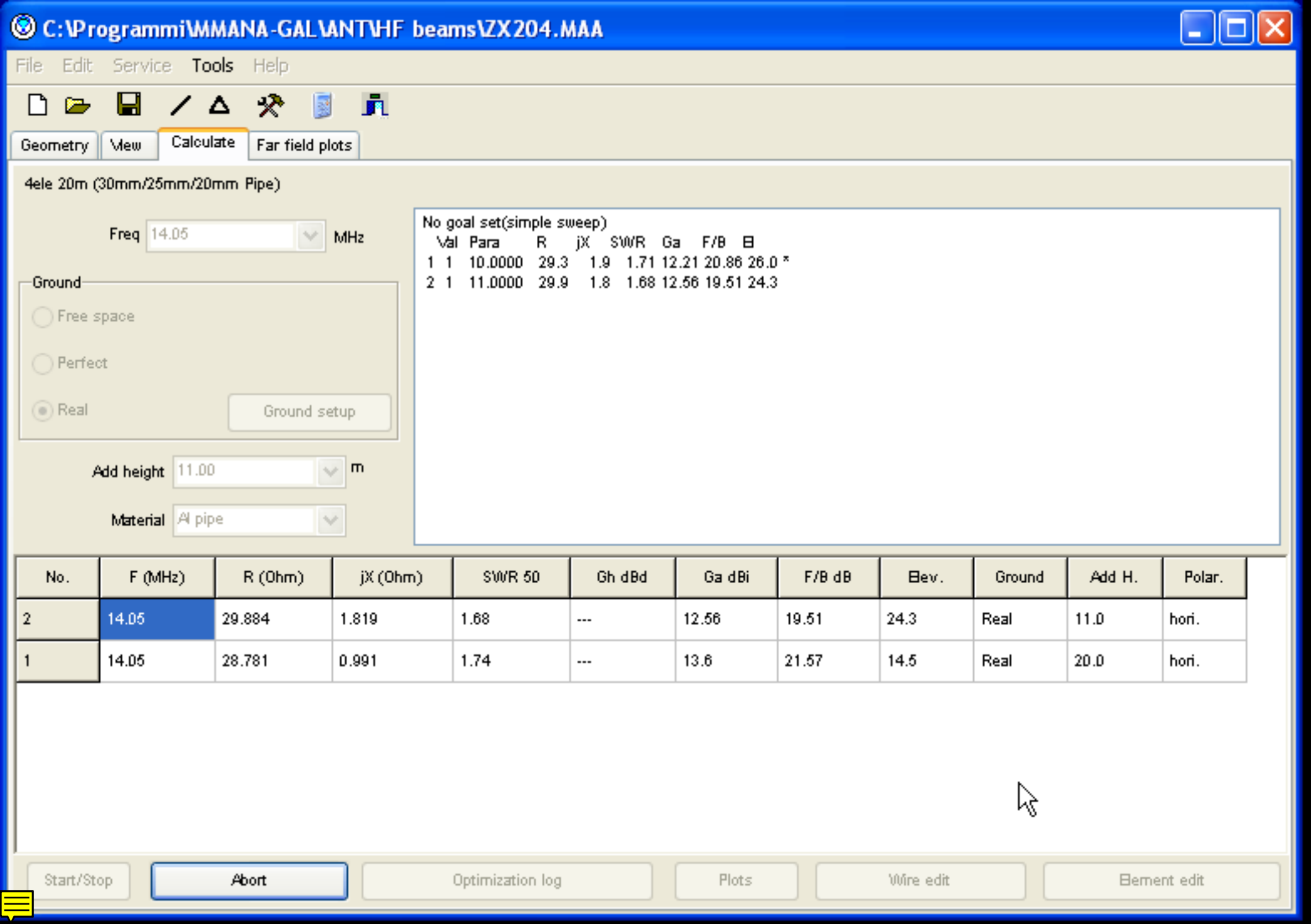
Material Al pipe

No goal set(simple sweep)

Val	Para	R	jX	SWR	Ga	F/B	⊟
1	1 10.0000	29.3	1.9	1.71	12.21	20.86	26.0 *

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	29.271	1.912	1.71	---	12.21	20.86	26.0	Real	10.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File Edit Service Tools Help
Geometry View Calculate Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
Freq 14.05 MHz
Ground
Free space
Perfect
Real
Ground setup
Add height 11.00 m
Material Al pipe
No goal set(simple sweep)
Val Para R jX SWR Ga F/B ⊟
1 1 10.0000 29.3 1.9 1.71 12.21 20.86 26.0 *
2 1 11.0000 29.9 1.8 1.68 12.56 19.51 24.3
No. F (MHz) R (Ohm) jX (Ohm) SWR 50 Gh dBd Ga dBi F/B dB Elev. Ground Add H. Polar.
2 14.05 29.884 1.819 1.68 --- 12.56 19.51 24.3 Real 11.0 hori.
1 14.05 28.781 0.991 1.74 --- 13.6 21.57 14.5 Real 20.0 hori.
Start/Stop
Abort
Optimization log
Plots
Wire edit
Element edit

C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

Add height 12.00 m

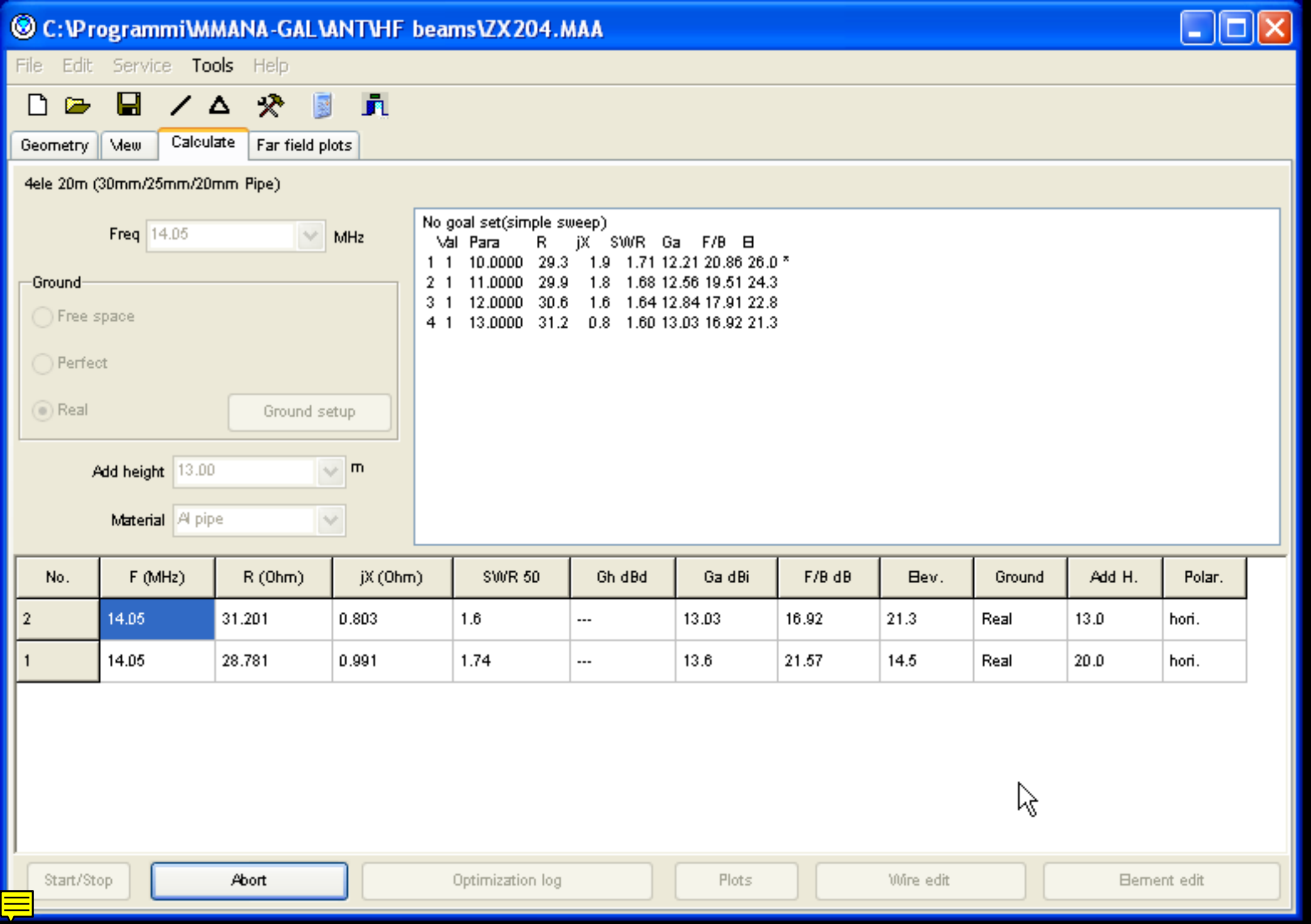
Material Al pipe

No goal set(simple sweep)

Val	Para	R	jX	SWR	Ga	F/B	⊟	
1	1	10.0000	29.3	1.9	1.71	12.21	20.86	26.0 *
2	1	11.0000	29.9	1.8	1.68	12.56	19.51	24.3
3	1	12.0000	30.6	1.6	1.64	12.84	17.91	22.8

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	30.569	1.572	1.64	---	12.84	17.91	22.8	Real	12.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit


C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File Edit Service Tools Help
Geometry View Calculate Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
Freq 14.05 MHz
Ground
Free space
Perfect
Real
Ground setup
Add height 13.00 m
Material Al pipe
No goal set(simple sweep)
Val Para R jX SWR Ga F/B ⊟
1 1 10.0000 29.3 1.9 1.71 12.21 20.86 26.0 *
2 1 11.0000 29.9 1.8 1.68 12.56 19.51 24.3
3 1 12.0000 30.6 1.6 1.64 12.84 17.91 22.8
4 1 13.0000 31.2 0.8 1.60 13.03 16.92 21.3
No. F (MHz) R (Ohm) jX (Ohm) SWR 50 Gh dBd Ga dBi F/B dB Elev. Ground Add H. Polar.
2 14.05 31.201 0.803 1.6 --- 13.03 16.92 21.3 Real 13.0 hori.
1 14.05 28.781 0.991 1.74 --- 13.6 21.57 14.5 Real 20.0 hori.
Start/Stop
Abort
Optimization log
Plots
Wire edit
Element edit

C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

Add height 14.00 m

Material Al pipe

No goal set(simple sweep)

Val	Para	R	jX	SWR	Ga	F/B	⊟	
1	1	10.0000	29.3	1.9	1.71	12.21	20.86	26.0 *
2	1	11.0000	29.9	1.8	1.68	12.56	19.51	24.3
3	1	12.0000	30.6	1.6	1.64	12.84	17.91	22.8
4	1	13.0000	31.2	0.8	1.60	13.03	16.92	21.3
5	1	14.0000	31.1	-0.4	1.61	13.16	17.39	20.0

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	31.111	-0.398	1.61	---	13.16	17.39	20.0	Real	14.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit

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File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

Add height 15.00 m

Material Al pipe

No goal set(simple sweep)

Val	Para	R	jX	SWR	Ga	F/B	⊟	
1	1	10.0000	29.3	1.9	1.71	12.21	20.86	26.0 *
2	1	11.0000	29.9	1.8	1.68	12.56	19.51	24.3
3	1	12.0000	30.6	1.6	1.64	12.84	17.91	22.8
4	1	13.0000	31.2	0.8	1.60	13.03	16.92	21.3
5	1	14.0000	31.1	-0.4	1.61	13.16	17.39	20.0
6	1	15.0000	30.2	-1.1	1.66	13.26	19.33	18.8

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	30.215	-1.15	1.66	---	13.26	19.33	18.8	Real	15.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit

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File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

Add height 16.00 m

Material Al pipe

No goal set(simple sweep)

Val	Para	R	jX	SWR	Ga	F/B	⊟	
1	1	10.0000	29.3	1.9	1.71	12.21	20.86	26.0 *
2	1	11.0000	29.9	1.8	1.68	12.56	19.51	24.3
3	1	12.0000	30.6	1.6	1.64	12.84	17.91	22.8
4	1	13.0000	31.2	0.8	1.60	13.03	16.92	21.3
5	1	14.0000	31.1	-0.4	1.61	13.16	17.39	20.0
6	1	15.0000	30.2	-1.1	1.66	13.26	19.33	18.8
7	1	16.0000	29.2	-1.1	1.71	13.35	19.72	17.7

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	29.235	-1.11	1.71	---	13.35	19.72	17.7	Real	16.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit

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File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

Add height 17.00 m

Material Al pipe

No goal set(simple sweep)

Val	Para	R	jX	SWR	Ga	F/B	⊟	
1	1	10.0000	29.3	1.9	1.71	12.21	20.86	26.0 *
2	1	11.0000	29.9	1.8	1.68	12.56	19.51	24.3
3	1	12.0000	30.6	1.6	1.64	12.84	17.91	22.8
4	1	13.0000	31.2	0.8	1.60	13.03	16.92	21.3
5	1	14.0000	31.1	-0.4	1.61	13.16	17.39	20.0
6	1	15.0000	30.2	-1.1	1.66	13.26	19.33	18.8
7	1	16.0000	29.2	-1.1	1.71	13.35	19.72	17.7
8	1	17.0000	28.6	-0.6	1.75	13.42	20.23	16.8

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	28.604	-0.602	1.75	---	13.42	20.23	16.8	Real	17.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit

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File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground

- Free space
- Perfect
- Real — Ground setup

Add height 18.00 m

Material Al pipe

No goal set(simple sweep)

Val	Para	R	jX	SWR	Ga	F/B	⊟	
1	1	10.0000	29.3	1.9	1.71	12.21	20.86	26.0 *
2	1	11.0000	29.9	1.8	1.68	12.56	19.51	24.3
3	1	12.0000	30.6	1.6	1.64	12.84	17.91	22.8
4	1	13.0000	31.2	0.8	1.60	13.03	16.92	21.3
5	1	14.0000	31.1	-0.4	1.61	13.16	17.39	20.0
6	1	15.0000	30.2	-1.1	1.66	13.26	19.33	18.8
7	1	16.0000	29.2	-1.1	1.71	13.35	19.72	17.7
8	1	17.0000	28.6	-0.6	1.75	13.42	20.23	16.8
9	1	18.0000	28.4	0.0	1.76	13.48	21.38	15.9

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	28.377	0.021	1.76	---	13.48	21.38	15.9	Real	18.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit

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File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

Add height 19.00 m

Material Al pipe

No goal set(simple sweep)

Val	Para	R	jX	SWR	Ga	F/B	⊟	
1	1	10.0000	29.3	1.9	1.71	12.21	20.86	26.0 *
2	1	11.0000	29.9	1.8	1.68	12.56	19.51	24.3
3	1	12.0000	30.6	1.6	1.64	12.84	17.91	22.8
4	1	13.0000	31.2	0.8	1.60	13.03	16.92	21.3
5	1	14.0000	31.1	-0.4	1.61	13.16	17.39	20.0
6	1	15.0000	30.2	-1.1	1.66	13.26	19.33	18.8
7	1	16.0000	29.2	-1.1	1.71	13.		
8	1	17.0000	28.6	-0.6	1.75	13.42	20.23	16.8
9	1	18.0000	28.4	0.0	1.76	13.48	21.38	15.9
Val	Para	R	jX	SWR	Ga	F/B	⊟	

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	28.472	0.581	1.76	---	13.54	22.85	15.2	Real	19.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit

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File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

Add height 19.00 m

Material Al pipe

No goal set(simple sweep)

Val	Para	R	jX	SWR	Ga	F/B	⊟	
1 1	10.0000	29.3	1.9	1.71	12.21	20.86	26.0	*
2 1	11.0000	29.9	1.8	1.68	12.56	19.51	24.3	
3 1	12.0000	30.6	1.6	1.64	12.84	17.91	22.8	
4 1	13.0000	31.2	0.8	1.60	13.03	16.92	21.3	
5 1	14.0000	31.1	-0.4	1.61	13.16	17.39	20.0	
6 1	15.0000	30.2	-1.1	1.66	13.26	19.33	18.8	
7 1	16.0000	29.2	-1.1	1.71	13.35	19.72	17.7	
8 1	17.0000	28.6	-0.6	1.75	13.42	20.23	16.8	
9 1	18.0000	28.4	0.0	1.76	13.48	21.38	15.9	
Val	Para	R	jX	SWR	Ga	F/B	⊟	
10 1	19.0000	28.5	0.6	1.76	13.54	22.85	15.2	

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	28.472	0.581	1.76	---	13.54	22.85	15.2	Real	19.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit

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File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

Add height 20.00 m

Material Al pipe

No goal set(simple sweep)

	Val	Para	R	jX	SWR	Ga	F/B	⊟	
1	1	10.0000	29.3	1.9	1.71	12.21	20.86	26.0	*
2	1	11.0000	29.9	1.8	1.68	12.56	19.51	24.3	
3	1	12.0000	30.6	1.6	1.64	12.84	17.91	22.8	
4	1	13.0000	31.2	0.8	1.60	13.03	16.92	21.3	
5	1	14.0000	31.1	-0.4	1.61	13.16	17.39	20.0	
6	1	15.0000	30.2	-1.1	1.66	13.26	19.33	18.8	
7	1	16.0000	29.2	-1.1	1.71	13.35	19.72	17.7	
8	1	17.0000	28.6	-0.6	1.75	13.42	20.23	16.8	
9	1	18.0000	28.4	0.0	1.76	13.48	21.38	15.9	
	Val	Para	R	jX	SWR	Ga	F/B	⊟	
10	1	19.0000	28.5	0.6	1.76	13.54	22.85	15.2	
11	1	20.0000	28.8	1.0	1.74	13.60	21.57	14.5	

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit

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File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

Add height 21.00 m

Material Al pipe

No goal set(simple sweep)

Val	Para	R	jX	SWR	Ga	F/B	⊟	
1 1	10.0000	29.3	1.9	1.71	12.21	20.86	26.0	*
2 1	11.0000	29.9	1.8	1.68	12.56	19.51	24.3	
3 1	12.0000	30.6	1.6	1.64	12.84	17.91	22.8	
4 1	13.0000	31.2	0.8	1.60	13.03	16.92	21.3	
5 1	14.0000	31.1	-0.4	1.61	13.16	17.39	20.0	
6 1	15.0000	30.2	-1.1	1.66	13.26	19.33	18.8	
7 1	16.0000	29.2	-1.1	1.71	13.35	19.72	17.7	
8 1	17.0000	28.6	-0.6	1.75	13.42	20.23	16.8	
9 1	18.0000	28.4	0.0	1.76	13.48	21.38	15.9	
Val	Para	R	jX	SWR	Ga	F/B	⊟	
10 1	19.0000	28.5	0.6	1.76	13.54	22.85	15.2	
11 1	20.0000	28.8	1.0	1.74	13.60	21.57	14.5	
12 1	21.0000	29.2	1.2	1.71	13.65	20.29	13.8	

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	29.21	1.216	1.71	---	13.65	20.29	13.8	Real	21.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit

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File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

Add height 22.00 m

Material Al pipe

Val	Para	R	jX	SWR	Ga	F/B	⊟	
1	1	10.0000	29.3	1.9	1.71	12.21	20.86	26.0 *
2	1	11.0000	29.9	1.8	1.68	12.56	19.51	24.3
3	1	12.0000	30.6	1.6	1.64	12.84	17.91	22.8
4	1	13.0000	31.2	0.8	1.60	13.03	16.92	21.3
5	1	14.0000	31.1	-0.4	1.61	13.16	17.39	20.0
6	1	15.0000	30.2	-1.1	1.66	13.26	19.33	18.8
7	1	16.0000	29.2	-1.1	1.71	13.35	19.72	17.7
8	1	17.0000	28.6	-0.6	1.75	13.42	20.23	16.8
9	1	18.0000	28.4	0.0	1.76	13.48	21.38	15.9
Val	Para	R	jX	SWR	Ga	F/B	⊟	
10	1	19.0000	28.5	0.6	1.76	13.54	22.85	15.2
11	1	20.0000	28.8	1.0	1.74	13.60	21.57	14.5
12	1	21.0000	29.2	1.2	1.71	13.65	20.29	13.8
13	1	22.0000	29.7	1.2	1.69	13.70	19.18	13.2

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	29.701	1.229	1.69	---	13.7	19.18	13.2	Real	22.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

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4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground

- Free space
- Perfect
- Real

Ground setup

Add height 23.00 m

Material Al pipe

1	1	10.0000	29.3	1.9	1.71	12.21	20.86	26.0 *
2	1	11.0000	29.9	1.8	1.68	12.56	19.51	24.3
3	1	12.0000	30.6	1.6	1.64	12.84	17.91	22.8
4	1	13.0000	31.2	0.8	1.60	13.03	16.92	21.3
5	1	14.0000	31.1	-0.4	1.61	13.16	17.39	20.0
6	1	15.0000	30.2	-1.1	1.66	13.26	19.33	18.8
7	1	16.0000	29.2	-1.1	1.71	13.35	19.72	17.7
8	1	17.0000	28.6	-0.6	1.75	13.42	20.23	16.8
9	1	18.0000	28.4	0.0	1.76	13.48	21.38	15.9
	Val	Para	R	jX	SWR	Ga	F/B	Ei
10	1	19.0000	28.5	0.6	1.76	13.54	22.85	15.2
11	1	20.0000	28.8	1.0	1.74	13.60	21.57	14.5
12	1	21.0000	29.2	1.2	1.71	13.65	20.29	13.8
13	1	22.0000	29.7	1.2	1.69	13.70	19.18	13.2
14	1	23.0000	30.2	1.0	1.66	13.74	18.41	12.7

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	30.165	0.982	1.66	---	13.74	18.41	12.7	Real	23.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

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4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground

- Free space
- Perfect
- Real — Ground setup

Add height 24.00 m

Material Al pipe

```
 2  1   11.0000   29.9    1.8   1.68 12.56 19.51 24.3
 3  1   12.0000   30.6    1.6   1.64 12.84 17.91 22.8
 4  1   13.0000   31.2    0.8   1.60 13.03 16.92 21.3
 5  1   14.0000   31.1   -0.4   1.61 13.16 17.39 20.0
 6  1   15.0000   30.2   -1.1   1.66 13.26 19.33 18.8
 7  1   16.0000   29.2   -1.1   1.71 13.35 19.72 17.7
 8  1   17.0000   28.6   -0.6   1.75 13.42 20.23 16.8
 9  1   18.0000   28.4    0.0   1.76 13.48 21.38 15.9
  Val  Para       R      jX    SWR   Ga    F/B   ⊟
10  1   19.0000   28.5    0.6   1.76 13.54 22.85 15.2
11  1   20.0000   28.8    1.0   1.74 13.60 21.57 14.5
12  1   21.0000   29.2    1.2   1.71 13.65 20.29 13.8
13  1   22.0000   29.7    1.2   1.69 13.70 19.18 13.2
14  1   23.0000   30.2    1.0   1.66 13.74 18.41 12.7
15  1   24.0000   30.4    0.5   1.64 13.76 18.23 12.2
```

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	30.417	0.451	1.64	---	13.76	18.23	12.2	Real	24.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

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4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground

- Free space
- Perfect
- Real — Ground setup

Add height 26.00 m

Material Al pipe

```
 3  1   12.0000   30.6    1.6   1.64 12.84 17.91 22.8
 4  1   13.0000   31.2    0.8   1.60 13.03 16.92 21.3
 5  1   14.0000   31.1   -0.4   1.61 13.16 17.39 20.0
 6  1   15.0000   30.2   -1.1   1.66 13.26 19.33 18.8
 7  1   16.0000   29.2   -1.1   1.71 13.35 19.72 17.7
 8  1   17.0000   28.6   -0.6   1.75 13.42 20.23 16.8
 9  1   18.0000   28.4    0.0   1.76 13.48 21.38 15.9
   Val  Para       R      jX    SWR   Ga    F/B   ⊟
10  1   19.0000   28.5    0.6   1.76 13.54 22.85 15.2
11  1   20.0000   28.8    1.0   1.74 13.60 21.57 14.5
12  1   21.0000   29.2    1.2   1.71 13.65 20.29 13.8
13  1   22.0000   29.7    1.2   1.69 13.70 19.18 13.2
14  1   23.0000   30.2    1.0   1.66 13.74 18.41 12.7
15  1   24.0000   30.4    0.5   1.64 13.76 18.23 12.2
16  1   25.0000   30.3   -0.1   1.65 13.79 18.86 11.7
```

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	29.808	-0.47	1.68	---	13.82	20.18	11.3	Real	26.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

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4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground

- Free space
- Perfect
- Real — Ground setup

Add height 27.00 m

Material Al pipe

```
 4  1   13.0000   31.2    0.8   1.60 13.03 16.92 21.3
 5  1   14.0000   31.1   -0.4   1.61 13.16 17.39 20.0
 6  1   15.0000   30.2   -1.1   1.66 13.26 19.33 18.8
 7  1   16.0000   29.2   -1.1   1.71 13.35 19.72 17.7
 8  1   17.0000   28.6   -0.6   1.75 13.42 20.23 16.8
 9  1   18.0000   28.4    0.0   1.76 13.48 21.38 15.9
   Val  Para       R      jX    SWR   Ga    F/B   B
10  1   19.0000   28.5    0.6   1.76 13.54 22.85 15.2
11  1   20.0000   28.8    1.0   1.74 13.60 21.57 14.5
12  1   21.0000   29.2    1.2   1.71 13.65 20.29 13.8
13  1   22.0000   29.7    1.2   1.69 13.70 19.18 13.2
14  1   23.0000   30.2    1.0   1.66 13.74 18.41 12.7
15  1   24.0000   30.4    0.5   1.64 13.76 18.
16  1   25.0000   30.3   -0.1   1.65 13.79 18.86 11.7
17  1   26.0000   29.8   -0.5   1.68 13.82 20.18 11.3
```

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	29.306	-0.455	1.71	---	13.86	21.74	10.9	Real	27.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

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4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground

- Free space
- Perfect
- Real — Ground setup

Add height 28.00 m

Material Al pipe

```
 5  1   14.0000   31.1   -0.4   1.61 13.16 17.39 20.0
 6  1   15.0000   30.2   -1.1   1.66 13.26 19.33 18.8
 7  1   16.0000   29.2   -1.1   1.71 13.35 19.72 17.7
 8  1   17.0000   28.6   -0.6   1.75 13.42 20.23 16.8
 9  1   18.0000   28.4    0.0   1.76 13.48 21.38 15.9
   Val  Para       R     jX    SWR   Ga    F/B   ⊟
10  1   19.0000   28.5    0.6   1.76 13.54 22.85 15.2
11  1   20.0000   28.8    1.0   1.74 13.60 21.57 14.5
12  1   21.0000   29.2    1.2   1.71 13.65 20.29 13.8
13  1   22.0000   29.7    1.2   1.69 13.70 19.18 13.2
14  1   23.0000   30.2    1.0   1.66 13.74 18.41 12.7
15  1   24.0000   30.4    0.5   1.64 13.76 18.23 12.2
16  1   25.0000   30.3   -0.1   1.65 13.79 18.86 11.7
17  1   26.0000   29.8   -0.5   1.68 13.82 20.18 11.3
18  1   27.0000   29.3   -0.5   1.71 13.86 21.74 10.9
```

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	28.946	-0.187	1.73	---	13.89	22.68	10.5	Real	28.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

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4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground

- Free space
- Perfect
- Real — Ground setup

Add height 28.00 m

Material Al pipe

```
 6  1   15.0000   30.2   -1.1   1.66 13.26 19.33 18.8
 7  1   16.0000   29.2   -1.1   1.71 13.35 19.72 17.7
 8  1   17.0000   28.6   -0.6   1.75 13.42 20.23 16.8
 9  1   18.0000   28.4    0.0   1.76 13.48 21.38 15.9
  Val  Para       R      jX     SWR   Ga    F/B   ⊟
10  1   19.0000   28.5    0.6   1.76 13.54 22.85 15.2
11  1   20.0000   28.8    1.0   1.74 13.60 21.57 14.5
12  1   21.0000   29.2    1.2   1.71 13.65 20.29 13.8
13  1   22.0000   29.7    1.2   1.69 13.70 19.18 13.2
14  1   23.0000   30.2    1.0   1.66 13.74 18.41 12.7
15  1   24.0000   30.4    0.5   1.64 13.76 18.23 12.2
16  1   25.0000   30.3   -0.1   1.65 13.79 18.86 11.7
17  1   26.0000   29.8   -0.5   1.68 13.82 20.18 11.3
18  1   27.0000   29.3   -0.5   1.71 13.86 21.74 10.9
19  1   28.0000   28.9   -0.2   1.73 13.89 22.68 10.5
```

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	28.946	-0.187	1.73	---	13.89	22.68	10.5	Real	28.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

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4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

Add height 29.00 m

Material Al pipe

```
 8  1   17.0000   28.6   -0.6   1.75 13.42 20.23 16.8
 9  1   18.0000   28.4    0.0   1.76 13.48 21.38 15.9
  Val  Para      R     jX   SWR   Ga   F/B   ⊟
10  1   19.0000   28.5    0.6   1.76 13.54 22.85 15.2
11  1   20.0000   28.8    1.0   1.74 13.60 21.57 14.5
12  1   21.0000   29.2    1.2   1.71 13.65 20.29 13.8
13  1   22.0000   29.7    1.2   1.69 13.70 19.18 13.2
14  1   23.0000   30.2    1.0   1.66 13.74 18.41 12.7
15  1   24.0000   30.4    0.5   1.64 13.76 18.23 12.2
16  1   25.0000   30.3   -0.1   1.65 13.79 18.86 11.7
17  1   26.0000   29.8   -0.5   1.68 13.82 20.18 11.3
18  1   27.0000   29.3   -0.5   1.71 13.86 21.74 10.9
19  1   28.0000   28.9   -0.2   1.73 13.89 22.68 10.5
  Val  Para      R     jX   SWR   Ga   F/B   ⊟
20  1   29.0000   28.8    0.2   1.74 13.92 22.56 10.2
```

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	28.801	0.175	1.74	---	13.92	22.56	10.2	Real	29.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

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4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

Add height 30.00 m

Material Al pipe

```
 9  1   18.0000   28.4    0.0   1.76 13.48 21.38 15.9
  Val  Para      R     jX   SWR   Ga   F/B   ⊟
10  1   19.0000   28.5    0.6   1.76 13.54 22.85 15.2
11  1   20.0000   28.8    1.0   1.74 13.60 21.57 14.5
12  1   21.0000   29.2    1.2   1.71 13.65 20.29 13.8
13  1   22.0000   29.7    1.2   1.69 13.70 19.18 13.2
14  1   23.0000   30.2    1.0   1.66 13.74 18.41 12.7
15  1   24.0000   30.4    0.5   1.64 13.76 18.23 12.2
16  1   25.0000   30.3   -0.1   1.65 13.79 18.86 11.7
17  1   26.0000   29.8   -0.5   1.68 13.82 20.18 11.3
18  1   27.0000   29.3   -0.5   1.71 13.86 21.74 10.9
19  1   28.0000   28.9   -0.2   1.73 13.89 22.68 10.5
  Val  Para      R     jX   SWR   Ga   F/B   ⊟
20  1   29.0000   28.8    0.2   1.74 13.92 22.56 10.2
21  1   30.0000   28.9    0.5   1.73 13.94 22.07  9.9
```

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	28.85	0.534	1.73	---	13.94	22.07	9.9	Real	30.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

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4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

Add height 31.00 m

Material Al pipe

Val	Para	R	jX	SWR	Ga	F/B	⊟
10	1	19.0000	28.5	0.6	1.76	13.54	22.85	15.2
11	1	20.0000	28.8	1.0	1.74	13.60	21.57	14.5
12	1	21.0000	29.2	1.2	1.71	13.65	20.29	13.8
13	1	22.0000	29.7	1.2	1.69	13.70	19.18	13.2
14	1	23.0000	30.2	1.0	1.66	13.74	18.41	12.7
15	1	24.0000	30.4	0.5	1.64	13.76	18.23	12.2
16	1	25.0000	30.3	-0.1	1.65	13.79	18.86	11.7
17	1	26.0000	29.8	-0.5	1.68	13.82	20.18	11.3
18	1	27.0000	29.3	-0.5	1.71	13.86	21.74	10.9
19	1	28.0000	28.9	-0.2	1.73	13.89	22.68	10.5
Val	Para	R	jX	SWR	Ga	F/B	⊟	
20	1	29.0000	28.8	0.2	1.74	13.92	22.56	10.2
21	1	30.0000	28.9	0.5	1.73	13.94	22.07	9.9
22	1	31.0000	29.1	0.8	1.72	13.96	21.05	9.6

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	29.054	0.801	1.72	---	13.96	21.05	9.6	Real	31.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

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4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

Add height 32.00 m

Material Al pipe

```
10  1   19.0000   28.5   0.6   1.76 13.54 22.85 15.2
11  1   20.0000   28.8   1.0   1.74 13.60 21.57 14.5
12  1   21.0000   29.2   1.2   1.71 13.65 20.29 13.8
13  1   22.0000   29.7   1.2   1.69 13.70 19.18 13.2
14  1   23.0000   30.2   1.0   1.66 13.74 18.41 12.7
15  1   24.0000   30.4   0.5   1.64 13.76 18.23 12.2
16  1   25.0000   30.3  -0.1   1.65 13.79 18.86 11.7
17  1   26.0000   29.8  -0.5   1.68 13.82 20.18 11.3
18  1   27.0000   29.3  -0.5   1.71 13.86 21.74 10.9
19  1   28.0000   28.9  -0.2   1.73 13.89 22.68 10.5
  Val Para      R     jX    SWR   Ga    F/B   ⊟
20  1   29.0000   28.8   0.2   1.74 13.92 22.56 10.2
21  1   30.0000   28.9   0.5   1.73 13.94 22.07  9.9
22  1   31.0000   29.1   0.8   1.72 13.96 21.05  9.6
23  1   32.0000   29.4   0.9   1.70 13.98 20.06  9.3
```

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	29.363	0.945	1.7	---	13.98	20.06	9.3	Real	32.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

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4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

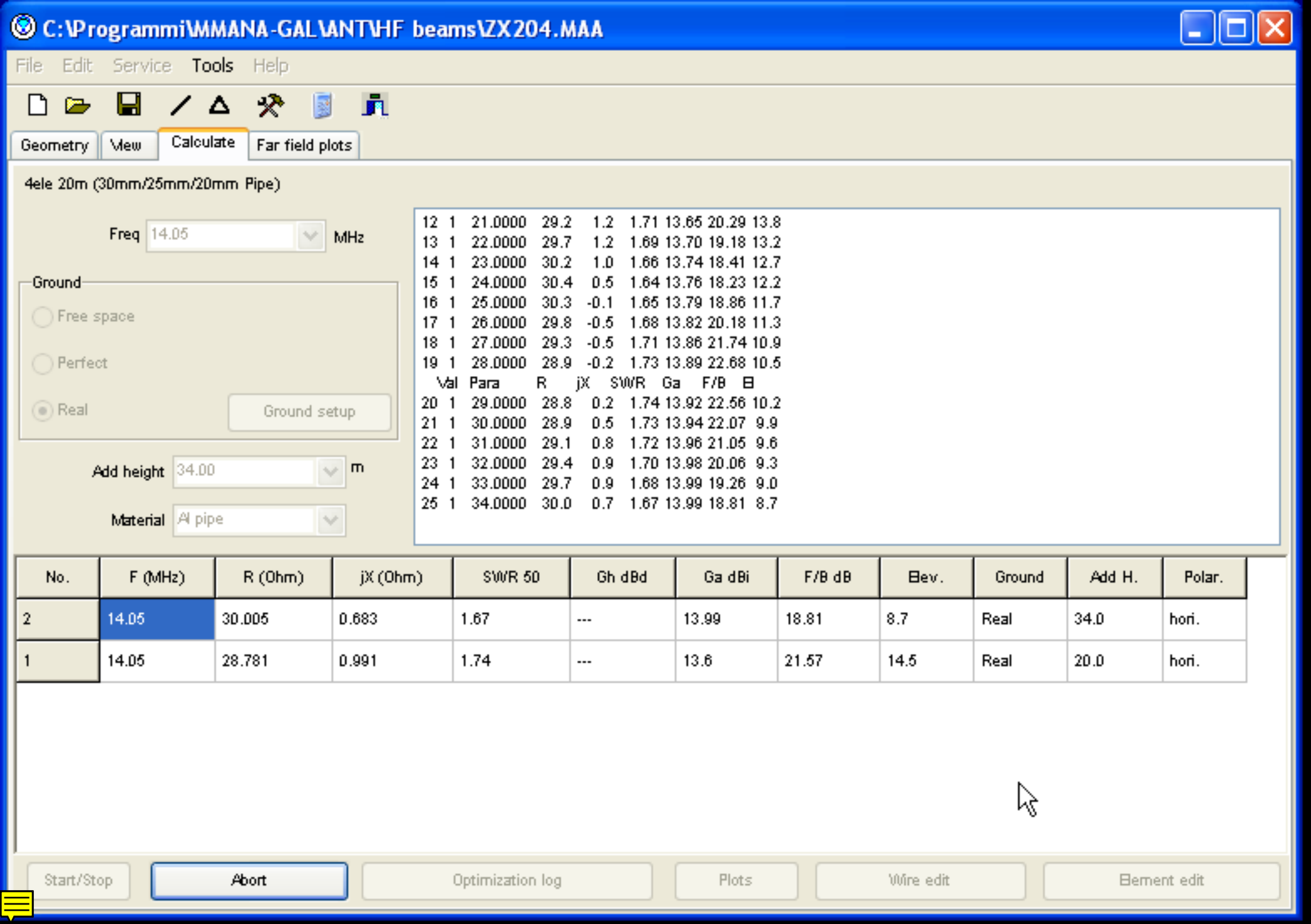
Add height 33.00 m

Material Al pipe

```
11  1   20.0000   28.8    1.0   1.74 13.60 21.57 14.5
12  1   21.0000   29.2    1.2   1.71 13.65 20.29 13.8
13  1   22.0000   29.7    1.2   1.69 13.70 19.18 13.2
14  1   23.0000   30.2    1.0   1.66 13.74 18.41 12.7
15  1   24.0000   30.4    0.5   1.64 13.76 18.23 12.2
16  1   25.0000   30.3   -0.1   1.65 13.79 18.86 11.7
17  1   26.0000   29.8   -0.5   1.68 13.82 20.18 11.3
18  1   27.0000   29.3   -0.5   1.71 13.86 21.74 10.9
19  1   28.0000   28.9   -0.2   1.73 13.89 22.68 10.5
  Val  Para       R      jX    SWR   Ga    F/B   Elv
20  1   29.0000   28.8    0.2   1.74 13.92 22.56 10.2
21  1   30.0000   28.9    0.5   1.73 13.94 22.07  9.9
22  1   31.0000   29.1    0.8   1.72 13.96 21.05  9.6
23  1   32.0000   29.4    0.9   1.70 13.98 20.06  9.3
24  1   33.0000   29.7    0.9   1.68 13.99 19.26  9.0
```

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	29.721	0.919	1.68	---	13.99	19.26	9.0	Real	33.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit



No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	30.005	0.683	1.67	---	13.99	18.81	8.7	Real	34.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

Add height 35.00 m

Material Al pipe

```
13  1   22.0000   29.7    1.2   1.69 13.70 19.18 13.2
14  1   23.0000   30.2    1.0   1.66 13.74 18.41 12.7
15  1   24.0000   30.4    0.5   1.64 13.76 18.23 12.2
16  1   25.0000   30.3   -0.1   1.65 13.79 18.86 11.7
17  1   26.0000   29.8   -0.5   1.68 13.82 20.18 11.3
18  1   27.0000   29.3   -0.5   1.71 13.86 21.74 10.9
19  1   28.0000   28.9   -0.2   1.73 13.89 22.68 10.5
  Val  Para       R      jX    SWR   Ga    F/B   B
20  1   29.0000   28.8    0.2   1.74 13.92 22.56 10.2
21  1   30.0000   28.9    0.5   1.73 13.94 22.07  9.9
22  1   31.0000   29.1    0.8   1.72 13.96 21.05  9.6
23  1   32.0000   29.4    0.9   1.70 13.98 20.06  9.3
24  1   33.0000   29.7    0.9   1.68 13.99 19.26  9.0
25  1   34.0000   30.0    0.7   1.67 13.99 18.81  8.7
26  1   35.0000   30.1    0.3   1.66 14.00 18.88  8.5
```

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	30.094	0.307	1.66	---	14.0	18.88	8.5	Real	35.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit

C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground

- Free space
- Perfect
- Real — Ground setup

Add height 36.00 m

Material Al pipe

```
14  1   23.0000   30.2    1.0   1.66 13.74 18.41 12.7
15  1   24.0000   30.4    0.5   1.64 13.76 18.23 12.2
16  1   25.0000   30.3   -0.1   1.65 13.79 18.86 11.7
17  1   26.0000   29.8   -0.5   1.68 13.82 20.18 11.3
18  1   27.0000   29.3   -0.5   1.71 13.86 21.74 10.9
19  1   28.0000   28.9   -0.2   1.73 13.89 22.68 10.5
  Val  Para       R      jX    SWR   Ga    F/B   B
20  1   29.0000   28.8    0.2   1.74 13.92 22.56 10.2
21  1   30.0000   28.9    0.5   1.73 13.94 22.07  9.9
22  1   31.0000   29.1    0.8   1.72 13.96 21.05  9.6
23  1   32.0000   29.4    0.9   1.70 13.98 20.06  9.3
24  1   33.0000   29.7    0.9   1.68 13.99 19.26  9.0
25  1   34.0000   30.0    0.7   1.67 13.99 18.81  8.7
26  1   35.0000   30.1    0.3   1.66 14.00 18.88  8.5
27  1   36.0000   29.9   -0.1   1.67 14.01 19.51  8.3
```

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	29.935	-0.057	1.67	---	14.01	19.51	8.3	Real	36.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit

C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground

- Free space
- Perfect
- Real — Ground setup

Add height 37.00 m

Material Al pipe

```
15  1   24.0000   30.4    0.5   1.64 13.76 18.23 12.2
16  1   25.0000   30.3   -0.1   1.65 13.79 18.86 11.7
17  1   26.0000   29.8   -0.5   1.68 13.82 20.18 11.3
18  1   27.0000   29.3   -0.5   1.71 13.86 21.74 10.9
19  1   28.0000   28.9   -0.2   1.73 13.89 22.68 10.5
  Val  Para      R     jX    SWR   Ga    F/B   ⊟
20  1   29.0000   28.8    0.2   1.74 13.92 22.56 10.2
21  1   30.0000   28.9    0.5   1.73 13.94 22.07  9.9
22  1   31.0000   29.1    0.8   1.72 13.96 21.05  9.6
23  1   32.0000   29.4    0.9   1.70 13.98 20.06  9.3
24  1   33.0000   29.7    0.9   1.68 13.99 19.26  9.0
25  1   34.0000   30.0    0.7   1.67 13.99 18.81  8.7
26  1   35.0000   30.1    0.3   1.66 14.00 18.88  8.5
27  1   36.0000   29.9   -0.1   1.67 14.01 19.51  8.3
28  1   37.0000   29.6   -0.2   1.69 14.03 20.53  8.1
```

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	29.612	-0.231	1.69	---	14.03	20.53	8.1	Real	37.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit

C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground

- Free space
- Perfect
- Real — Ground setup

Add height 38.00 m

Material Al pipe

```
16  1   25.0000   30.3   -0.1   1.65 13.79 18.86 11.7
17  1   26.0000   29.8   -0.5   1.68 13.82 20.18 11.3
18  1   27.0000   29.3   -0.5   1.71 13.86 21.74 10.9
19  1   28.0000   28.9   -0.2   1.73 13.89 22.68 10.5
  Val  Para      R     jX    SWR   Ga   F/B   ⊟
20  1   29.0000   28.8    0.2   1.74 13.92 22.56 10.2
21  1   30.0000   28.9    0.5   1.73 13.94 22.07  9.9
22  1   31.0000   29.1    0.8   1.72 13.96 21.05  9.6
23  1   32.0000   29.4    0.9   1.70 13.98 20.06  9.3
24  1   33.0000   29.7    0.9   1.68 13.99 19.26  9.0
25  1   34.0000   30.0    0.7   1.67 13.99 18.81  8.7
26  1   35.0000   30.1    0.3   1.66 14.00 18.88  8.5
27  1   36.0000   29.9   -0.1   1.67 14.01 19.51  8.3
28  1   37.0000   29.6   -0.2   1.69 14.03 20.53  8.1
29  1   38.0000   29.3   -0.2   1.71 14.05 21.57  7.8
```

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	29.286	-0.188	1.71	---	14.05	21.57	7.8	Real	38.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit

C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA

File Edit Service Tools Help

Geometry | View | Calculate | Far field plots

4ele 20m (30mm/25mm/20mm Pipe)

Freq 14.05 MHz

Ground
- Free space
- Perfect
- Real — Ground setup

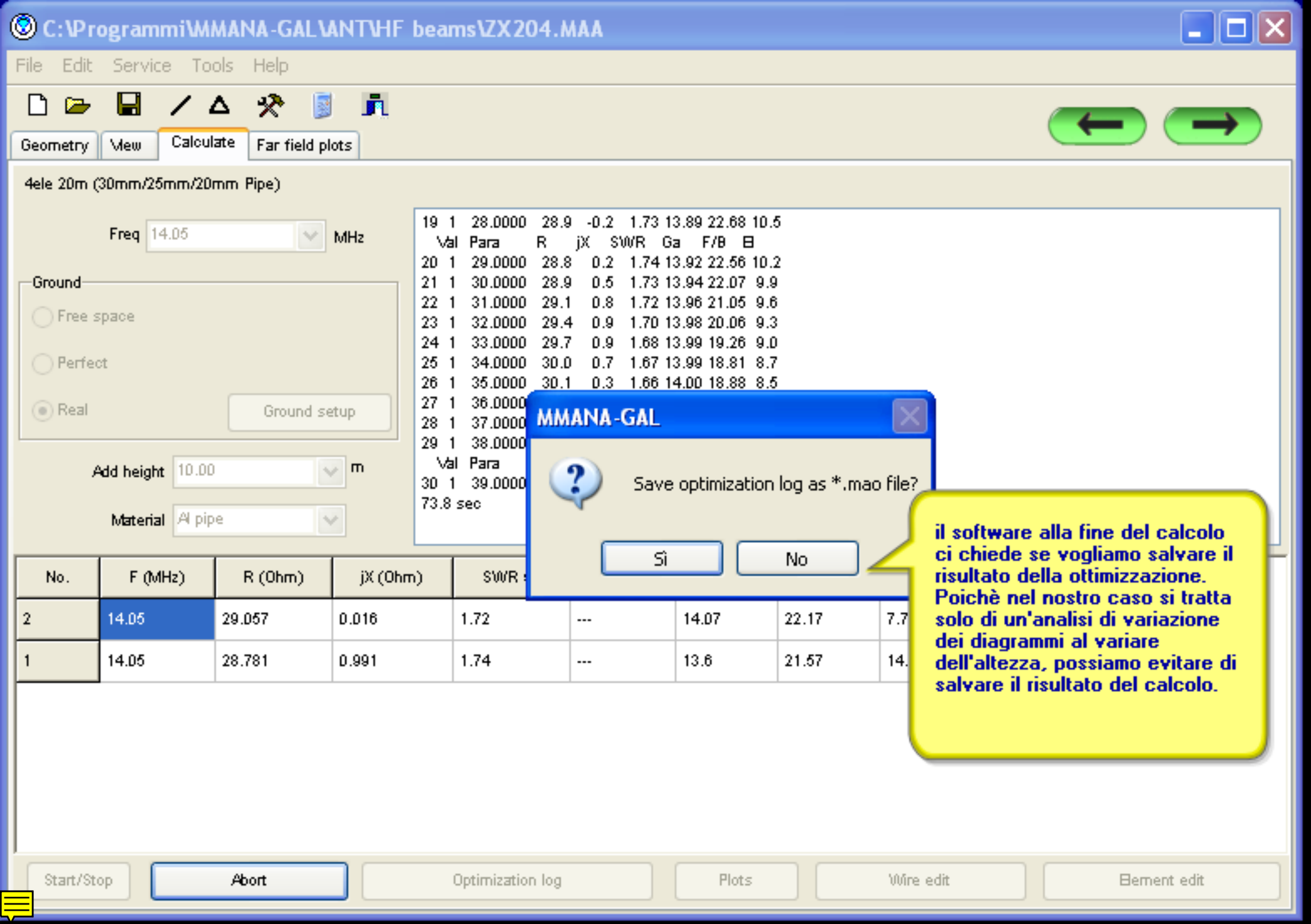
Add height 39.00 m

Material Al pipe

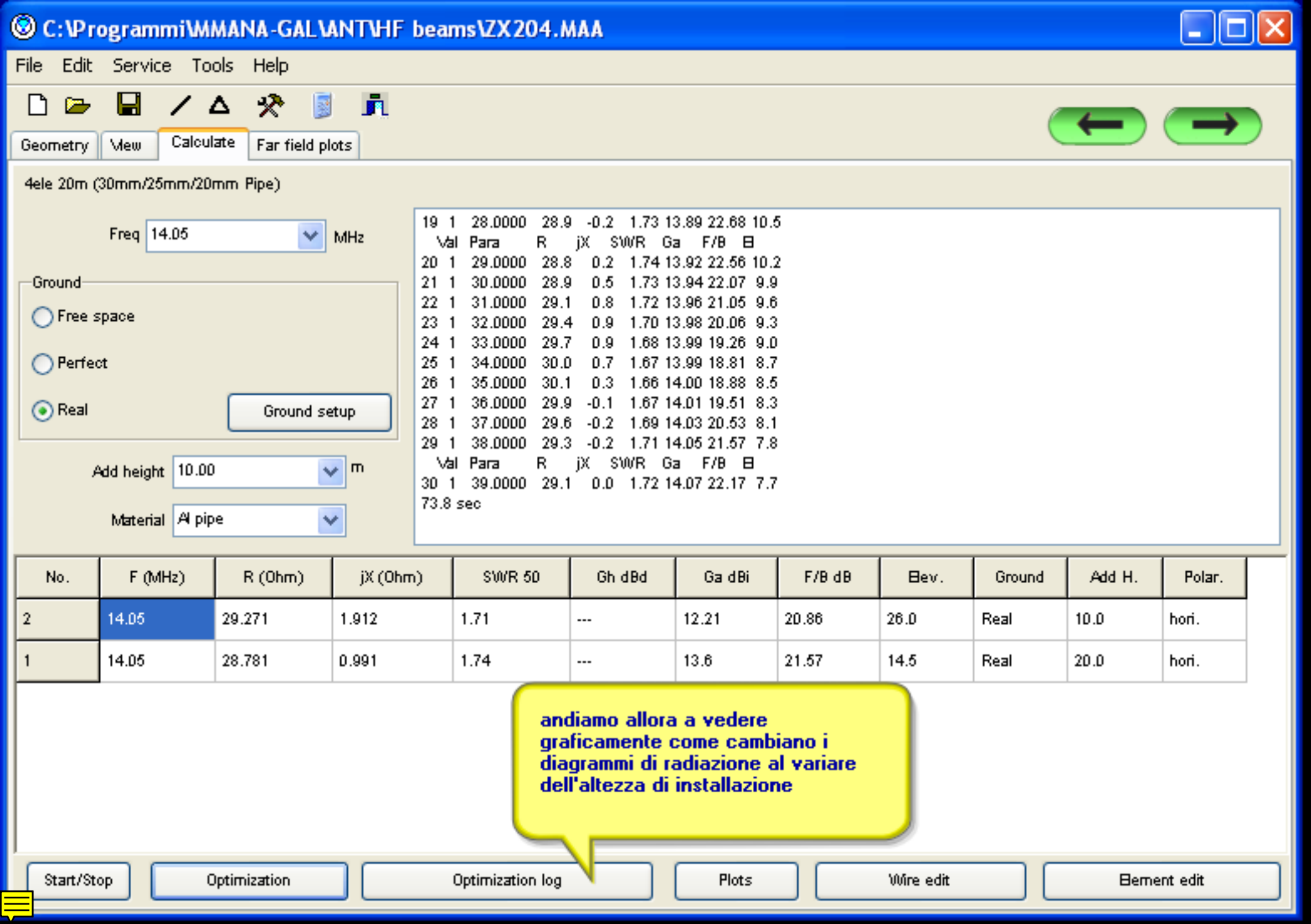
```
19  1   28.0000   28.9   -0.2   1.73 13.89 22.68 10.5
  Val  Para      R     jX    SWR   Ga    F/B   ⊟
20  1   29.0000   28.8    0.2   1.74 13.92 22.56 10.2
21  1   30.0000   28.9    0.5   1.73 13.94 22.07  9.9
22  1   31.0000   29.1    0.8   1.72 13.96 21.05  9.6
23  1   32.0000   29.4    0.9   1.70 13.98 20.06  9.3
24  1   33.0000   29.7    0.9   1.68 13.99 19.26  9.0
25  1   34.0000   30.0    0.7   1.67 13.99 18.81  8.7
26  1   35.0000   30.1    0.3   1.66 14.00 18.88  8.5
27  1   36.0000   29.9   -0.1   1.67 14.01 19.51  8.3
28  1   37.0000   29.6   -0.2   1.69 14.03 20.53  8.1
29  1   38.0000   29.3   -0.2   1.71 14.05 21.57  7.8
  Val  Para      R     jX    SWR   Ga    F/B   ⊟
30  1   39.0000   29.1    0.0   1.72 14.07 22.17  7.7
73.8 sec
```

No.	F (MHz)	R (Ohm)	jX (Ohm)	SWR 50	Gh dBd	Ga dBi	F/B dB	Elev.	Ground	Add H.	Polar.
2	14.05	29.057	0.016	1.72	---	14.07	22.17	7.7	Real	39.0	hori.
1	14.05	28.781	0.991	1.74	---	13.6	21.57	14.5	Real	20.0	hori.

Start/Stop | Abort | Optimization log | Plots | Wire edit | Element edit



il software alla fine del calcolo ci chiede se vogliamo salvare il risultato della ottimizzazione. Poichè nel nostro caso si tratta solo di un'analisi di variazione dei diagrammi al variare dell'altezza, possiamo evitare di salvare il risultato del calcolo.

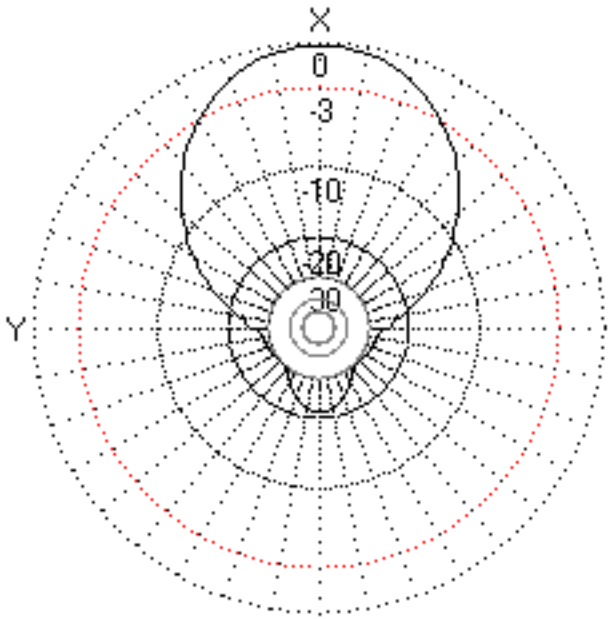

C:\Programmi\MMANA-GAL\ANT\HF beams\ZX204.MAA
File Edit Service Tools Help
Geometry View Calculate Far field plots
4ele 20m (30mm/25mm/20mm Pipe)
Freq 14.05 MHz
Ground
Free space
Perfect
Real
Ground setup
Add height 10.00 m
Material Al pipe
19 1 28.0000 28.9 -0.2 1.73 13.89 22.68 10.5
Val Para R jX SWR Ga F/B ⊟
20 1 29.0000 28.8 0.2 1.74 13.92 22.56 10.2
21 1 30.0000 28.9 0.5 1.73 13.94 22.07 9.9
22 1 31.0000 29.1 0.8 1.72 13.96 21.05 9.6
23 1 32.0000 29.4 0.9 1.70 13.98 20.06 9.3
24 1 33.0000 29.7 0.9 1.68 13.99 19.26 9.0
25 1 34.0000 30.0 0.7 1.67 13.99 18.81 8.7
26 1 35.0000 30.1 0.3 1.66 14.00 18.88 8.5
27 1 36.0000 29.9 -0.1 1.67 14.01 19.51 8.3
28 1 37.0000 29.6 -0.2 1.69 14.03 20.53 8.1
29 1 38.0000 29.3 -0.2 1.71 14.05 21.57 7.8
Val Para R jX SWR Ga F/B ⊟
30 1 39.0000 29.1 0.0 1.72 14.07 22.17 7.7
73.8 sec
No. F (MHz) R (Ohm) jX (Ohm) SWR 50 Gh dBd Ga dBi F/B dB Elev. Ground Add H. Polar.
2 14.05 29.271 1.912 1.71 --- 12.21 20.86 26.0 Real 10.0 hori.
1 14.05 28.781 0.991 1.74 --- 13.6 21.57 14.5 Real 20.0 hori.
andiamo allora a vedere graficamente come cambiano i diagrammi di radiazione al variare dell'altezza di installazione
Start/Stop
Optimization
Optimization log
Plots
Wire edit
Element edit

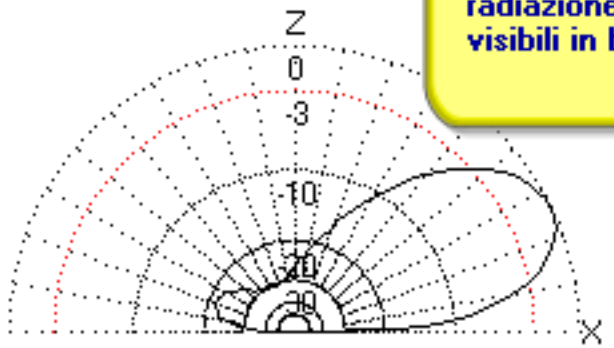
Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51		
30	29.3 + j1.91	1.71	12.21	20.86		

ad ogni riga corrisponde il risultato del calcolo ad altezza dal suolo via via crescente, da 10 a 40 metri. E i diagrammi di radiazione corrispondenti sono visibili in basso.





12.21(dBi) = 0dB

Order

Evolution value

OK

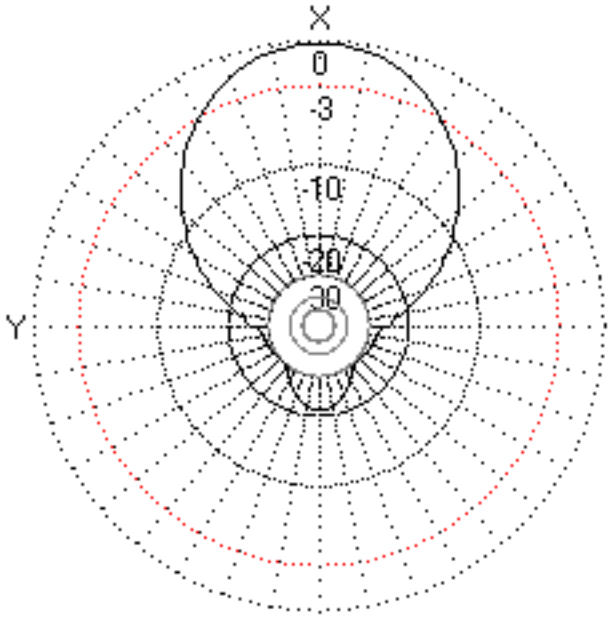
Cancel

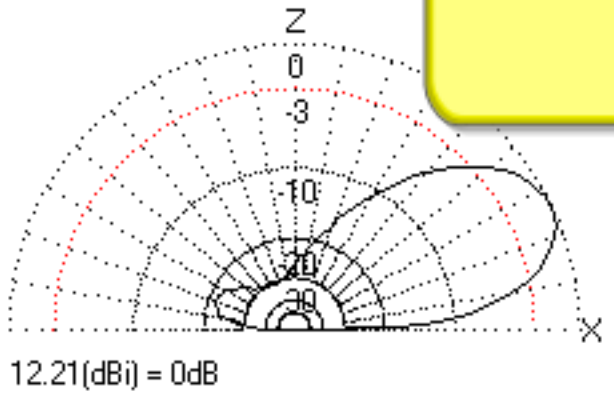
Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51		
30	29.3 + j1.91	1.71	12.21	20.86		

spostandoci con i tasti cursore sulle le righe superiori vedremo variare corrispondentemente i diagrammi di radiazione.





12.21(dBi) = 0dB

Order

Evolution value

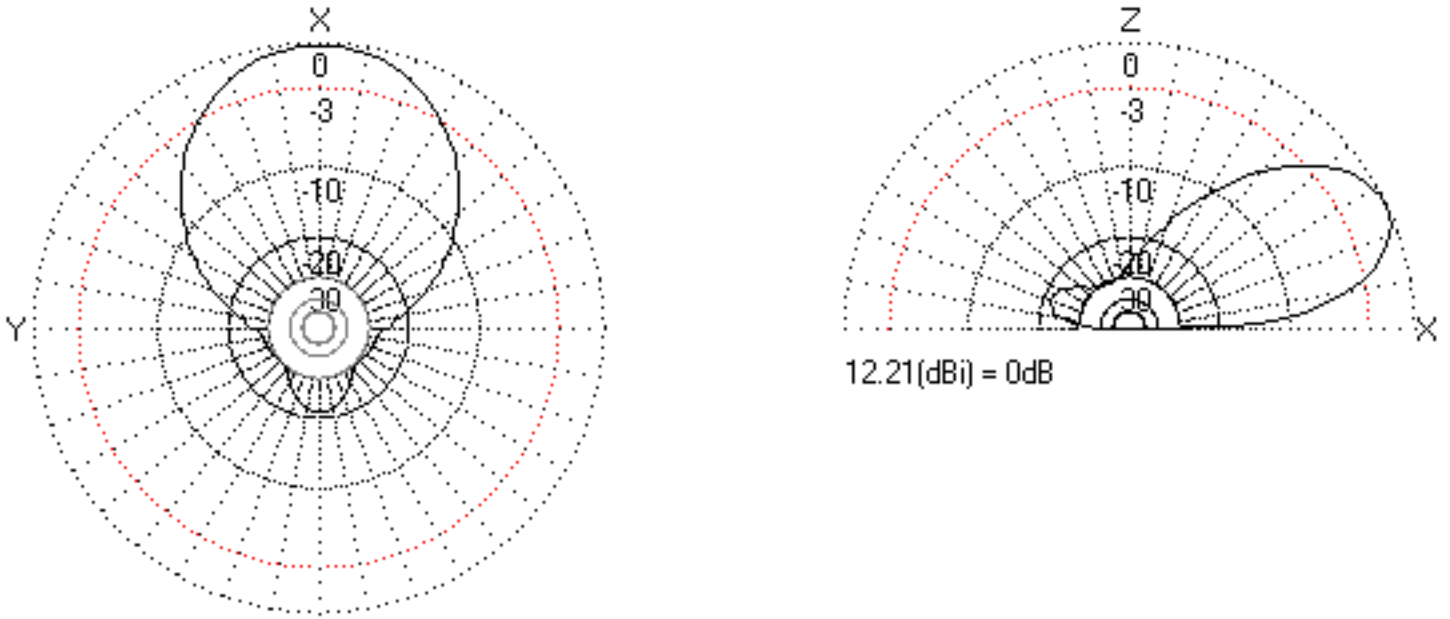
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



12.21(dBi) = 0dB

Order

Evolution value

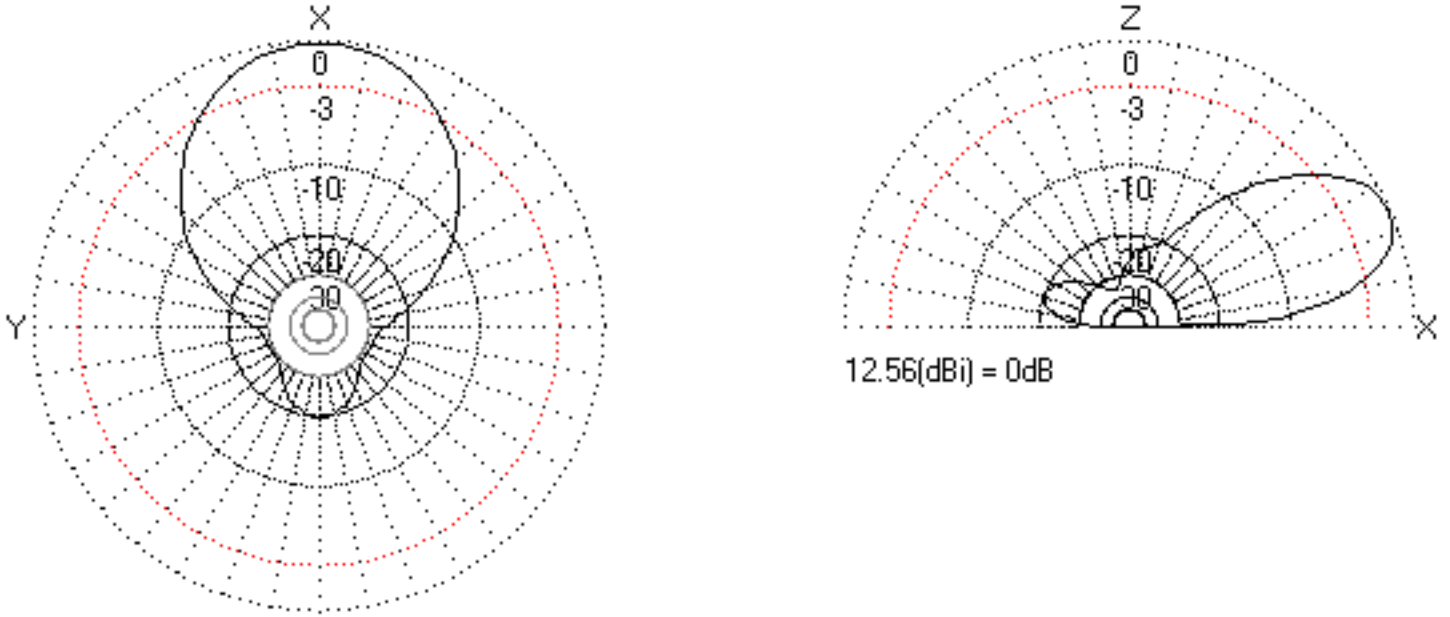
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vt
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



12.56(dBi) = 0dB

Order

Evolution value

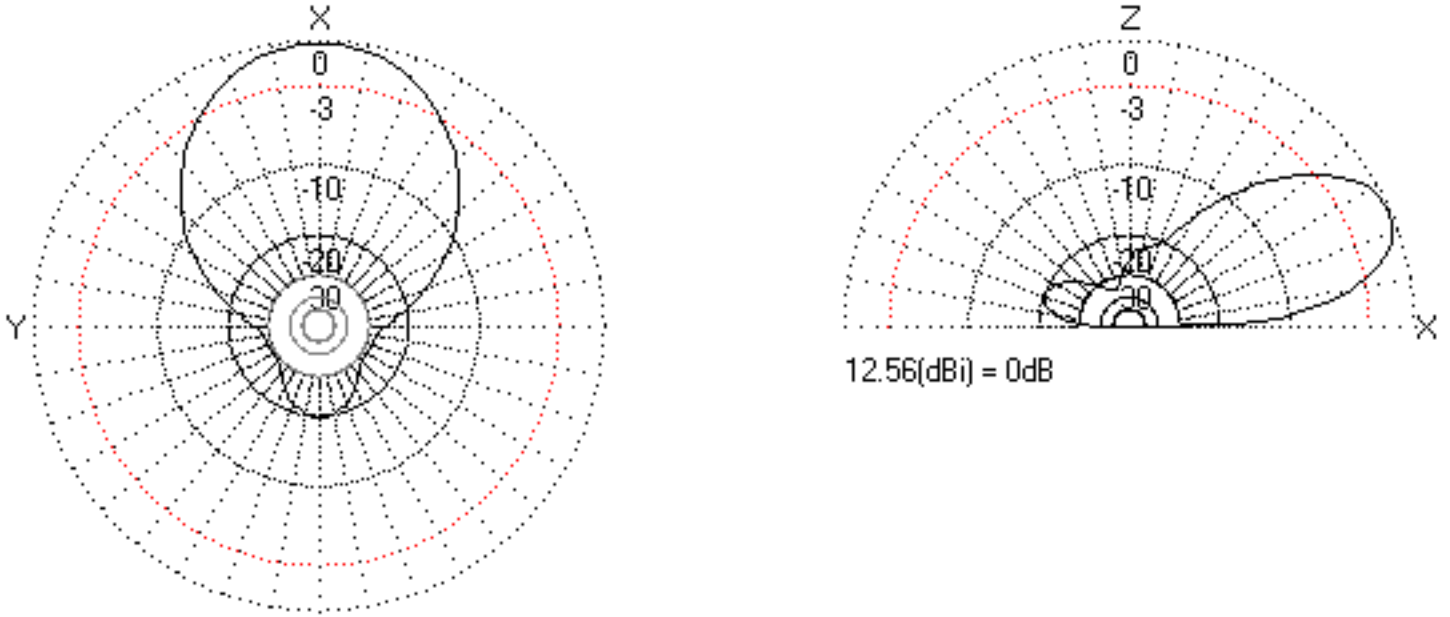
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vt
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



12.56(dBi) = 0dB

Order

Evolution value

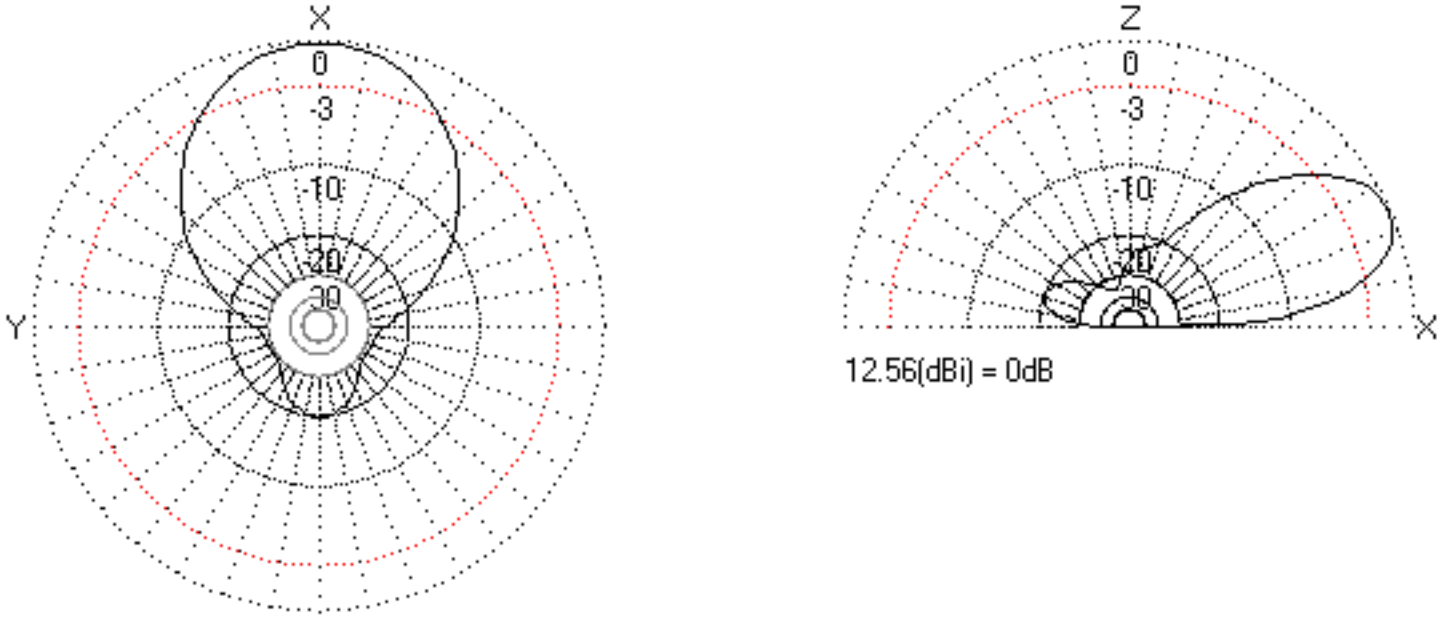
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vt
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



12.56(dBi) = 0dB

Order

Evolution value

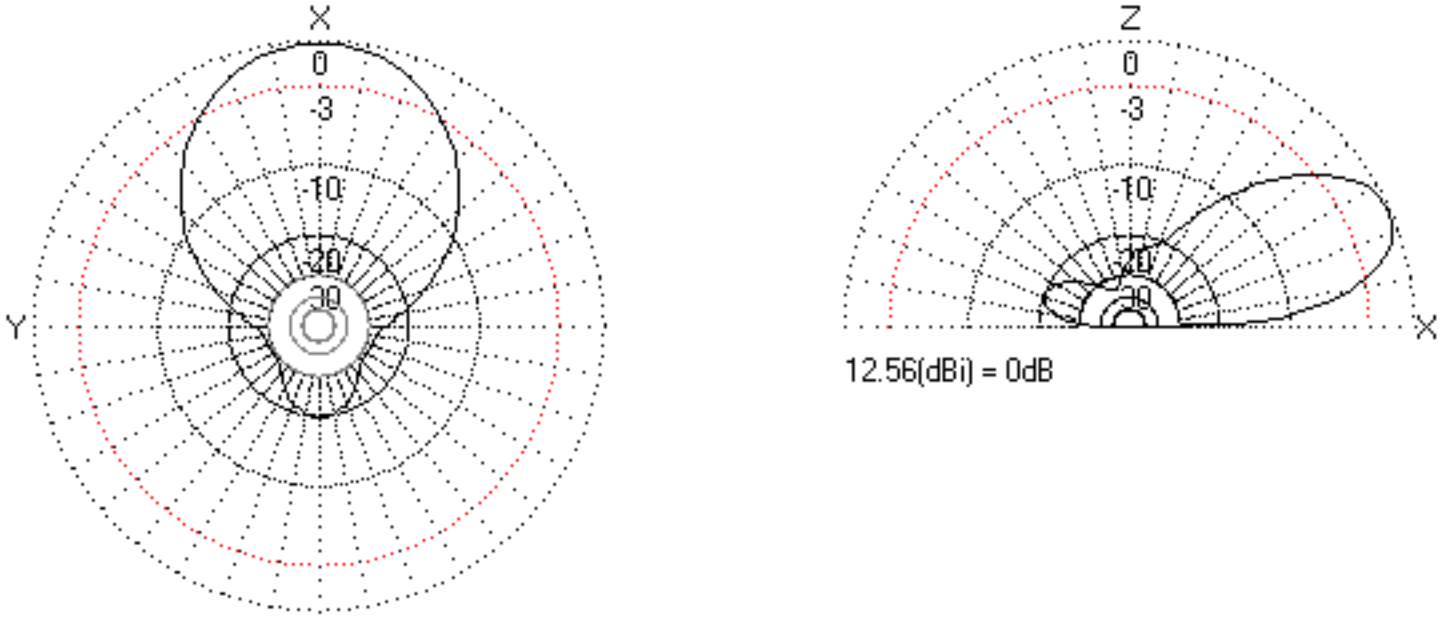
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vt
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



12.56(dBi) = 0dB

Order

Evolution value

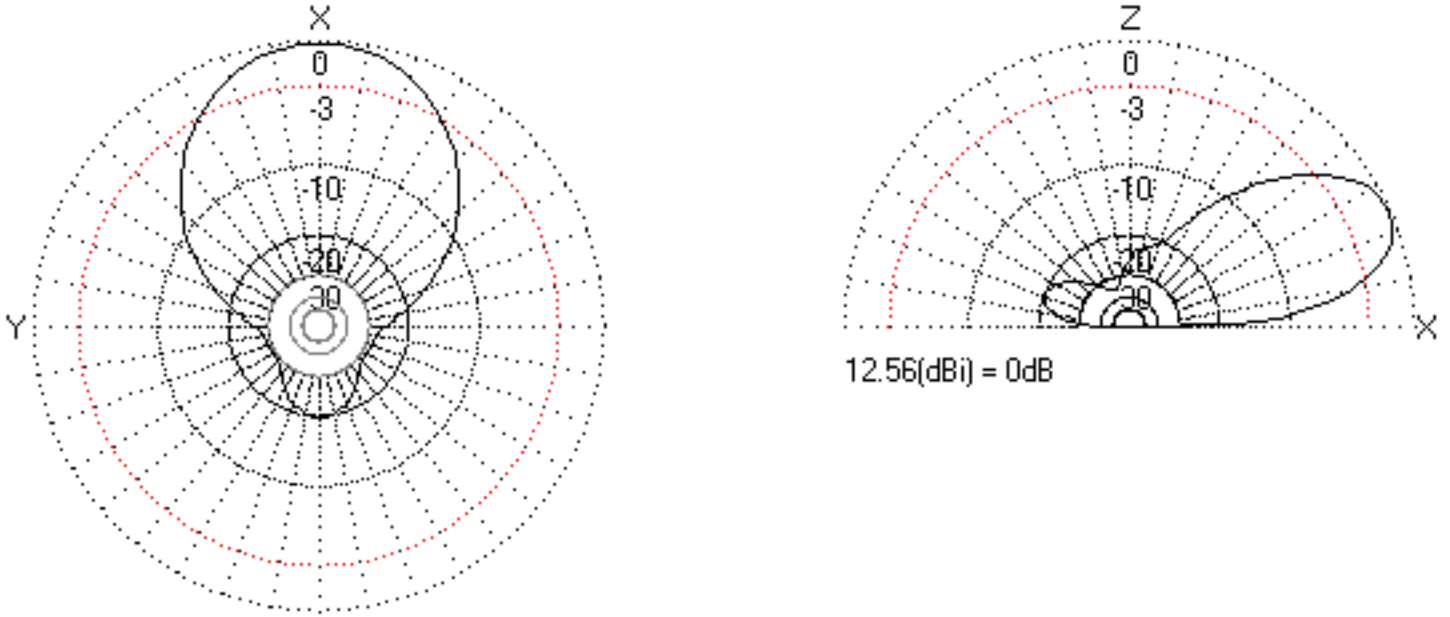
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vt
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



12.56(dBi) = 0dB

Order

Evolution value

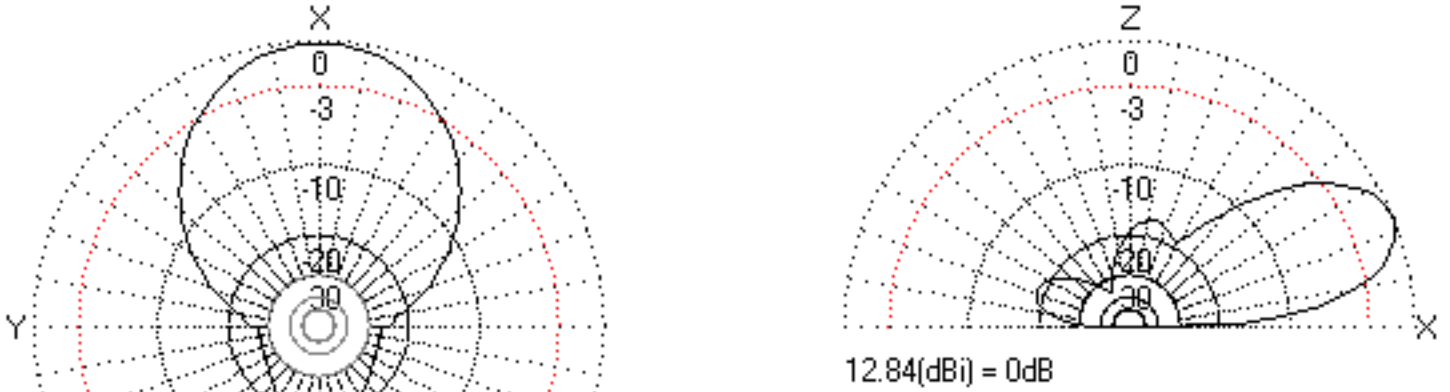
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



12.84(dBi) = 0dB

Order

Evolution value

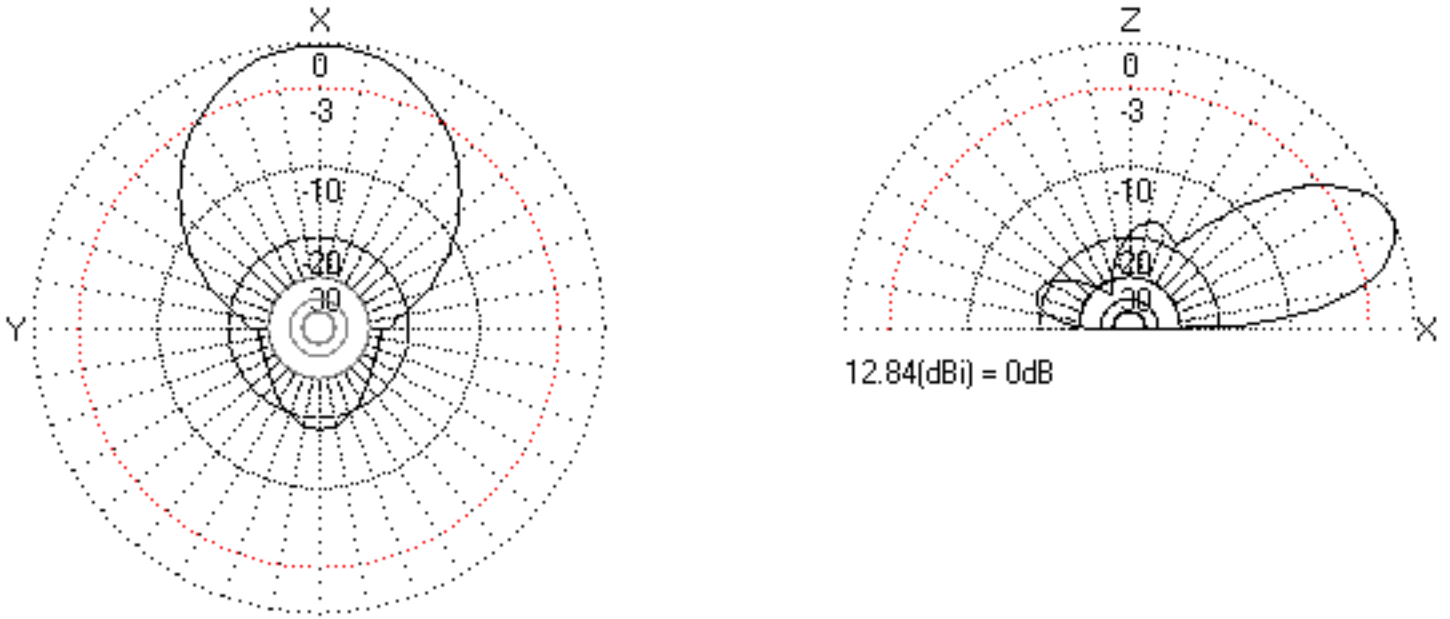
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



12.84(dBi) = 0dB

Order

Evolution value

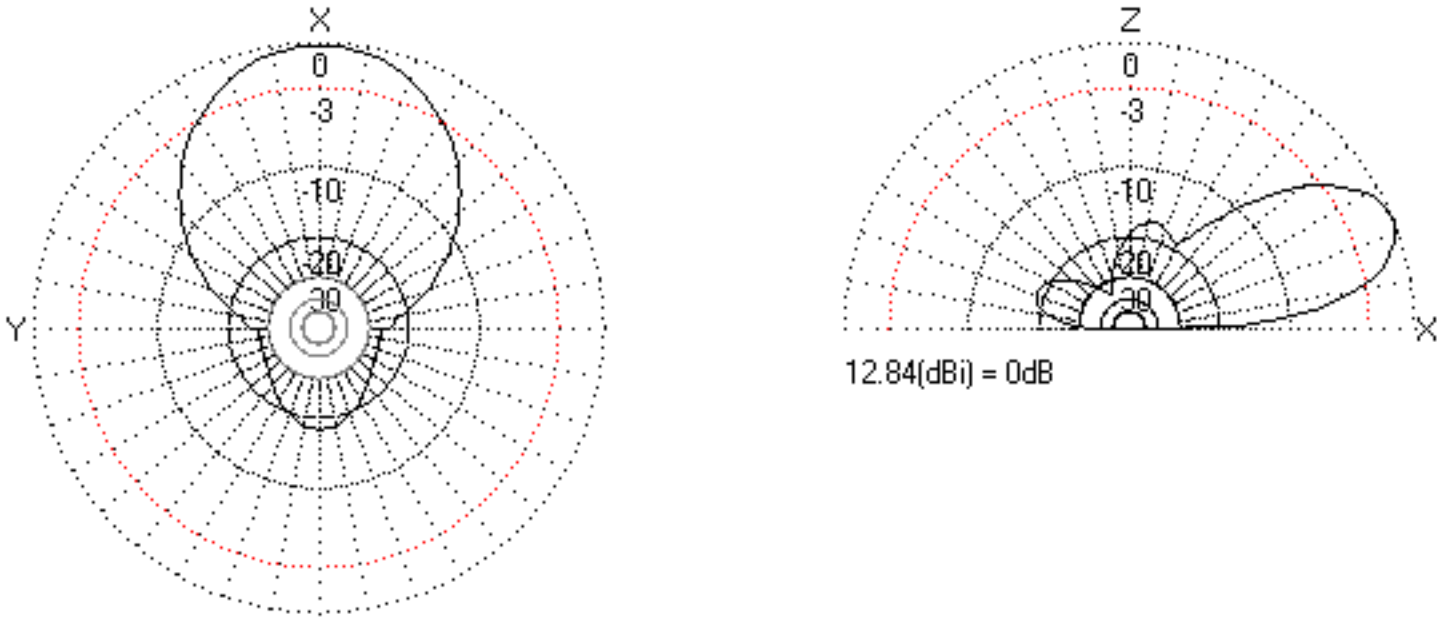
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



12.84(dBi) = 0dB

Order

Evolution value

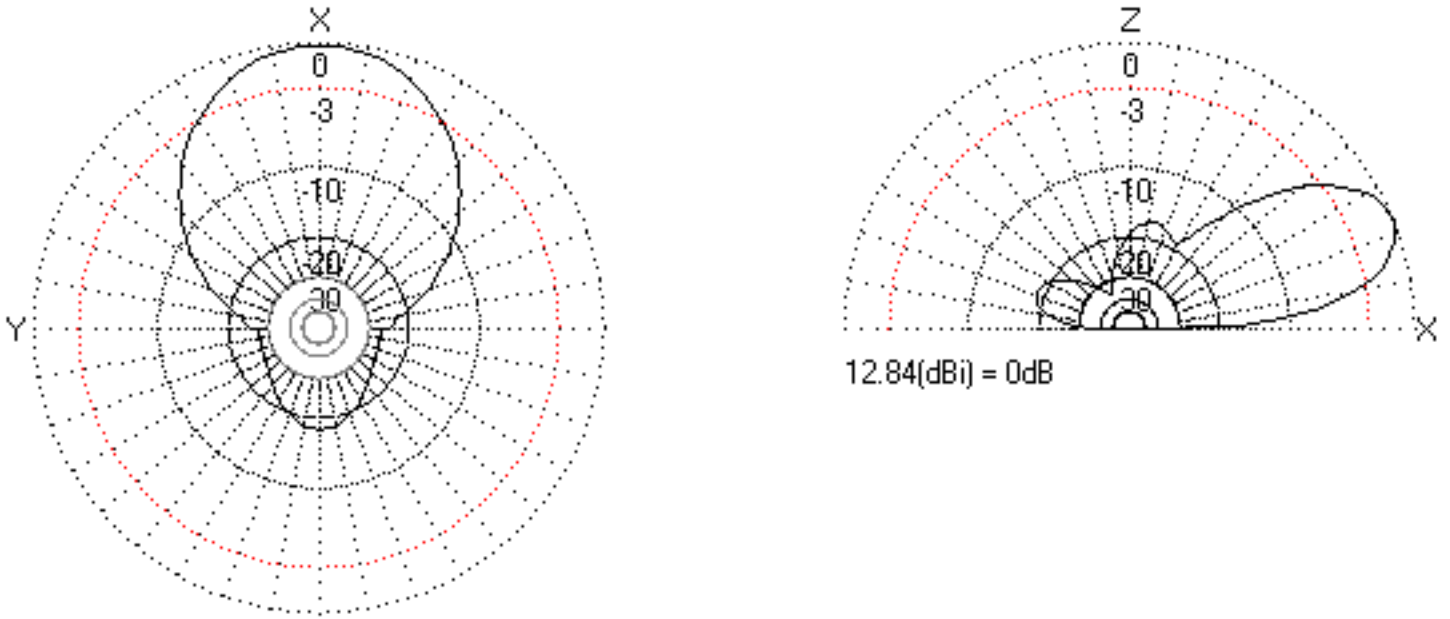
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



12.84(dBi) = 0dB

Order

Evolution value

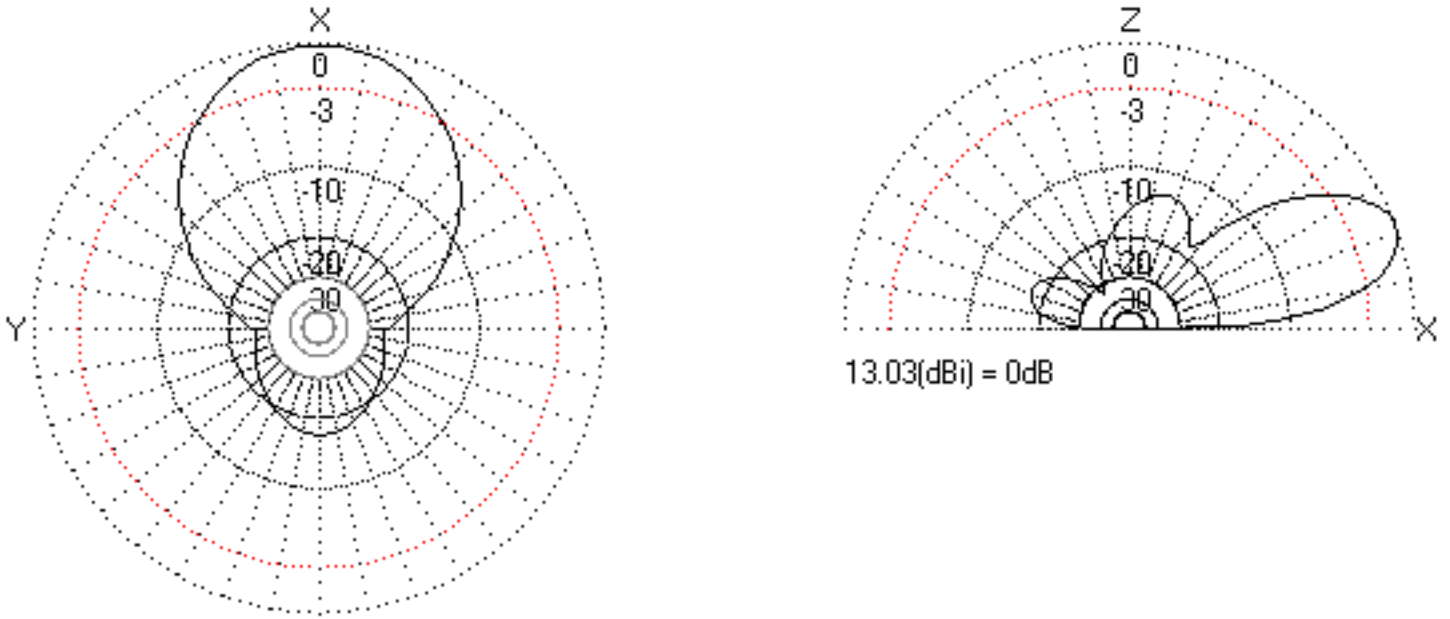
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vt
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



Order

Evolution value

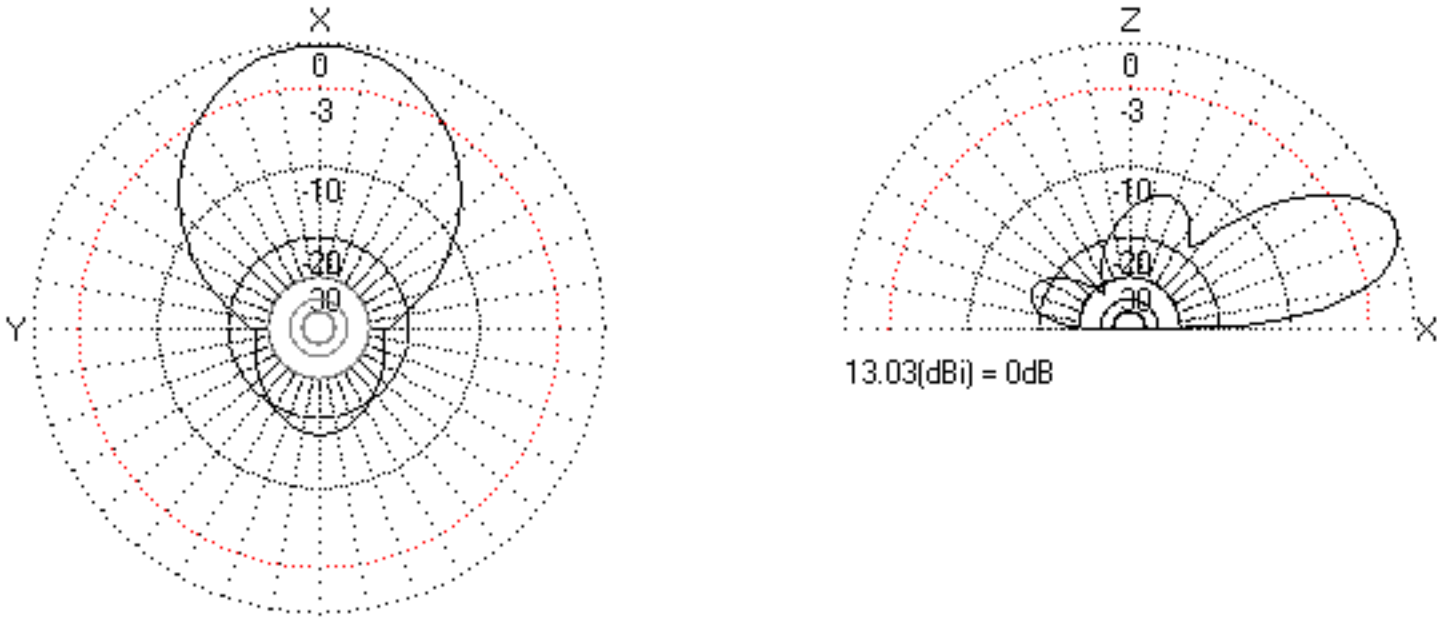
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vt
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



Order

Evolution value

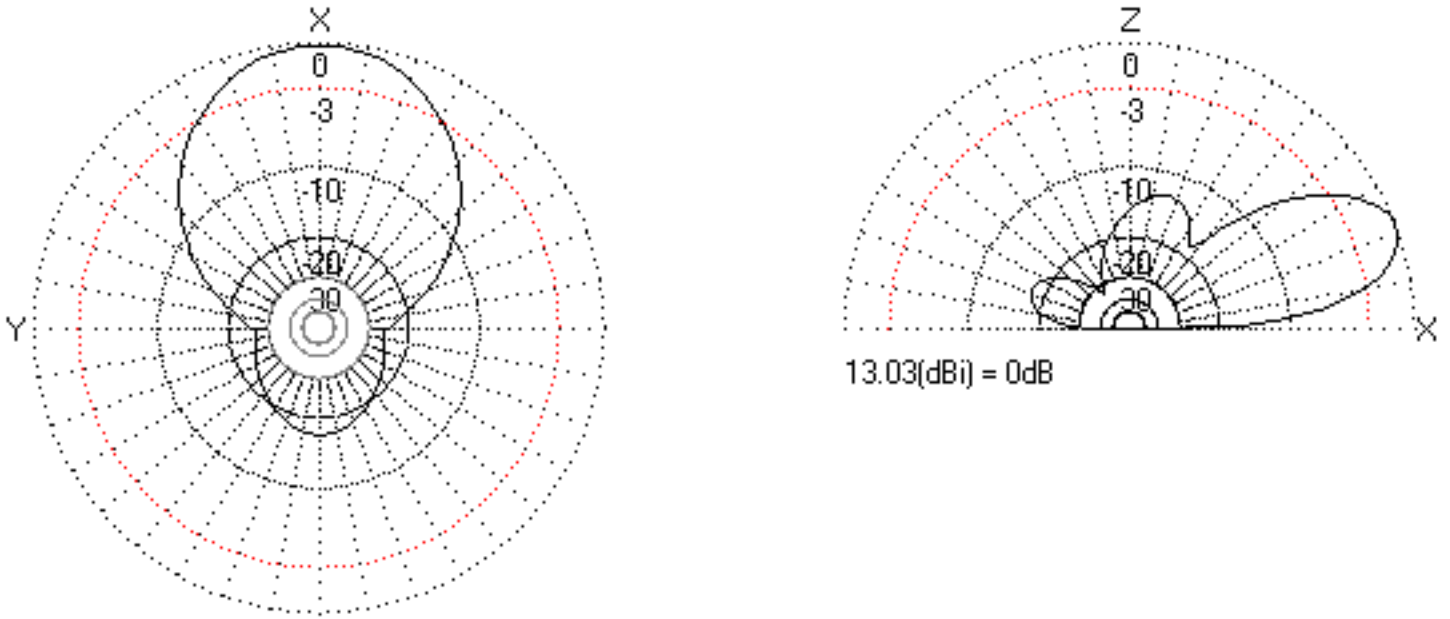
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vt
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



Order

Evolution value

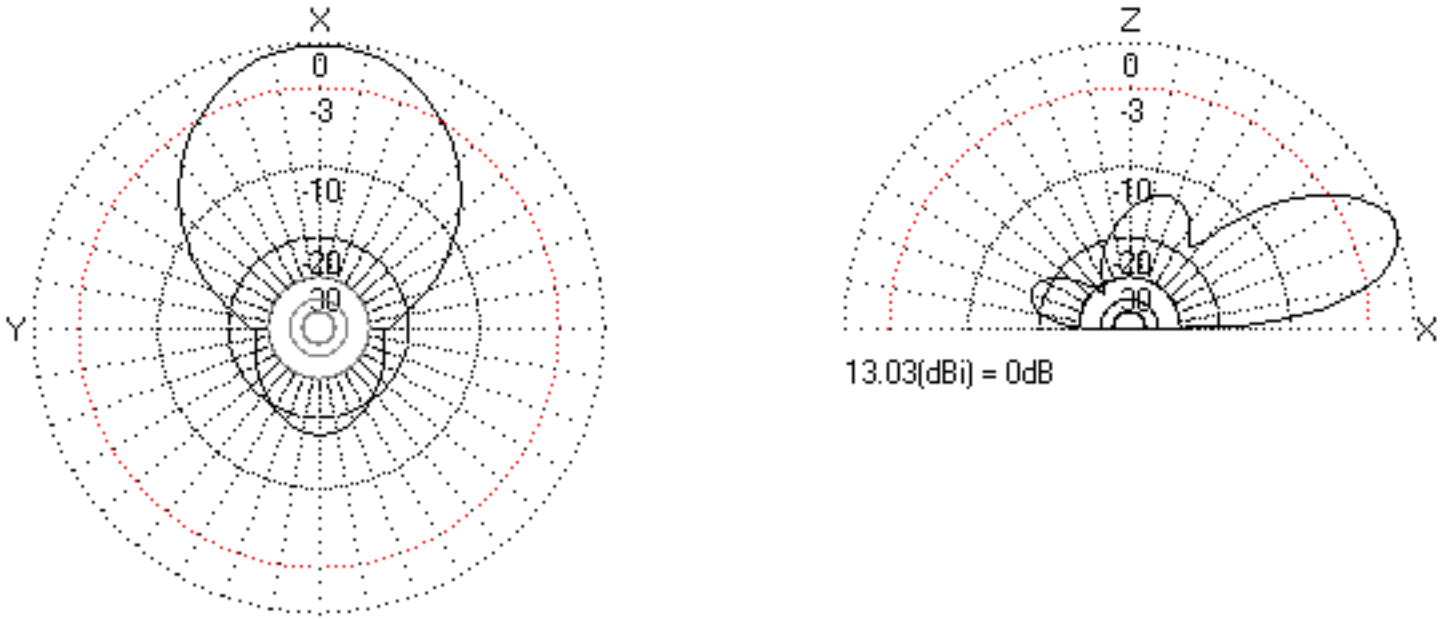
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vt
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



Order

Evolution value

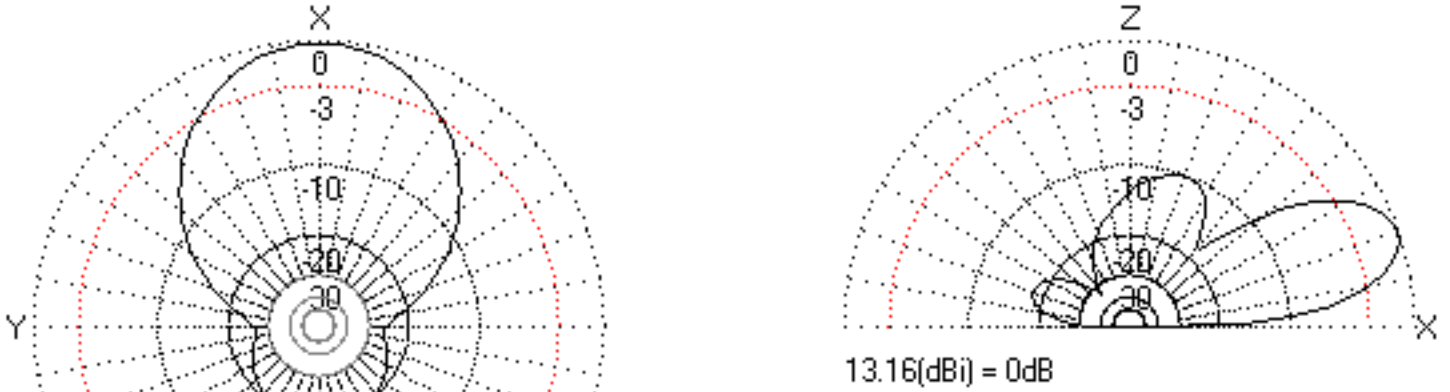
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



Order

Evolution value

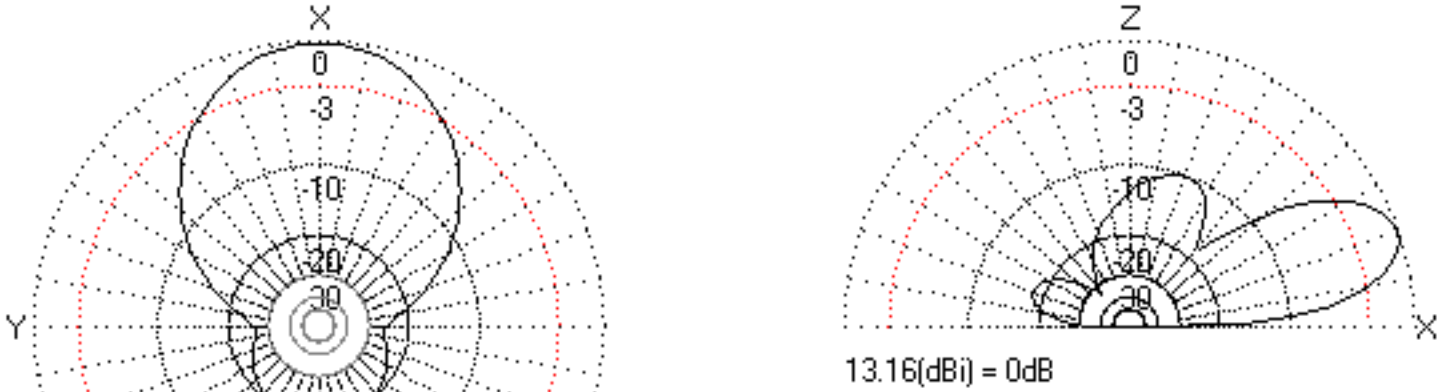
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



Order

Evolution value

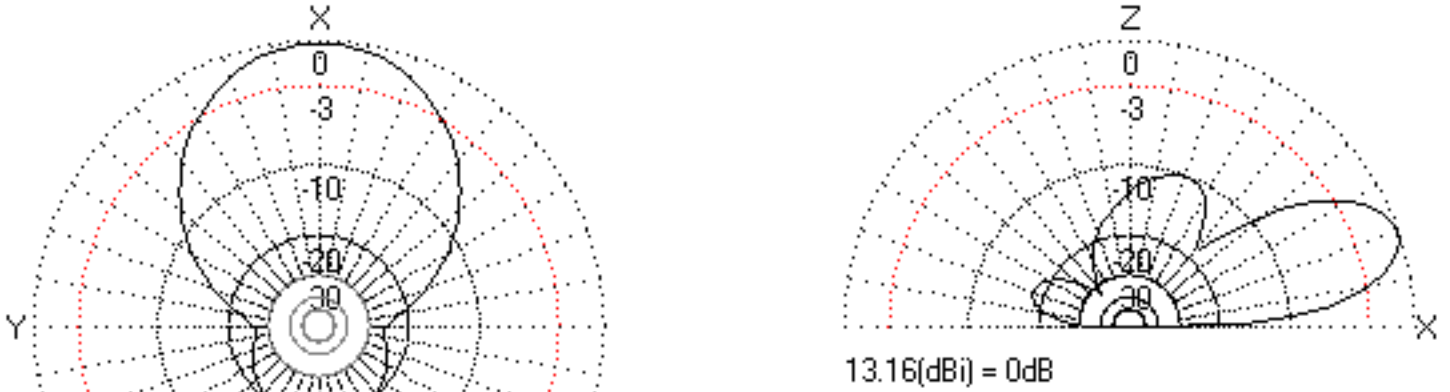
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



Order

Evolution value

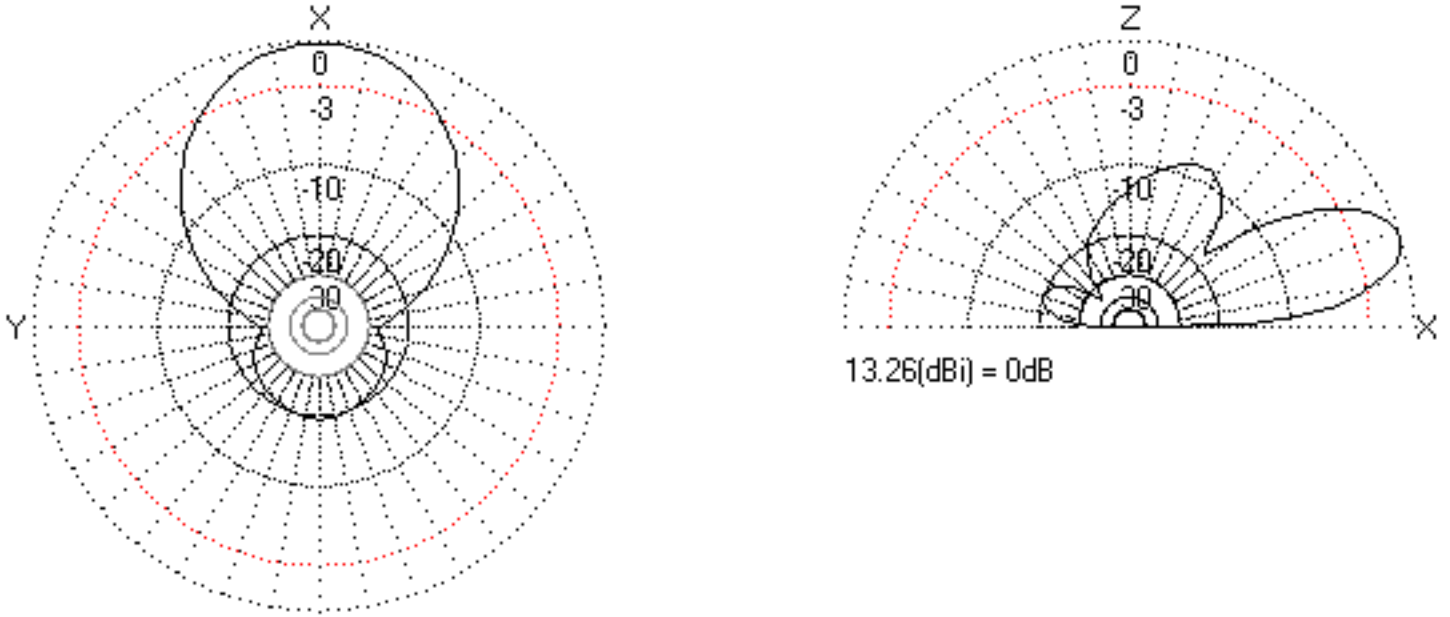
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



13.26(dBi) = 0dB

Order

Evolution value

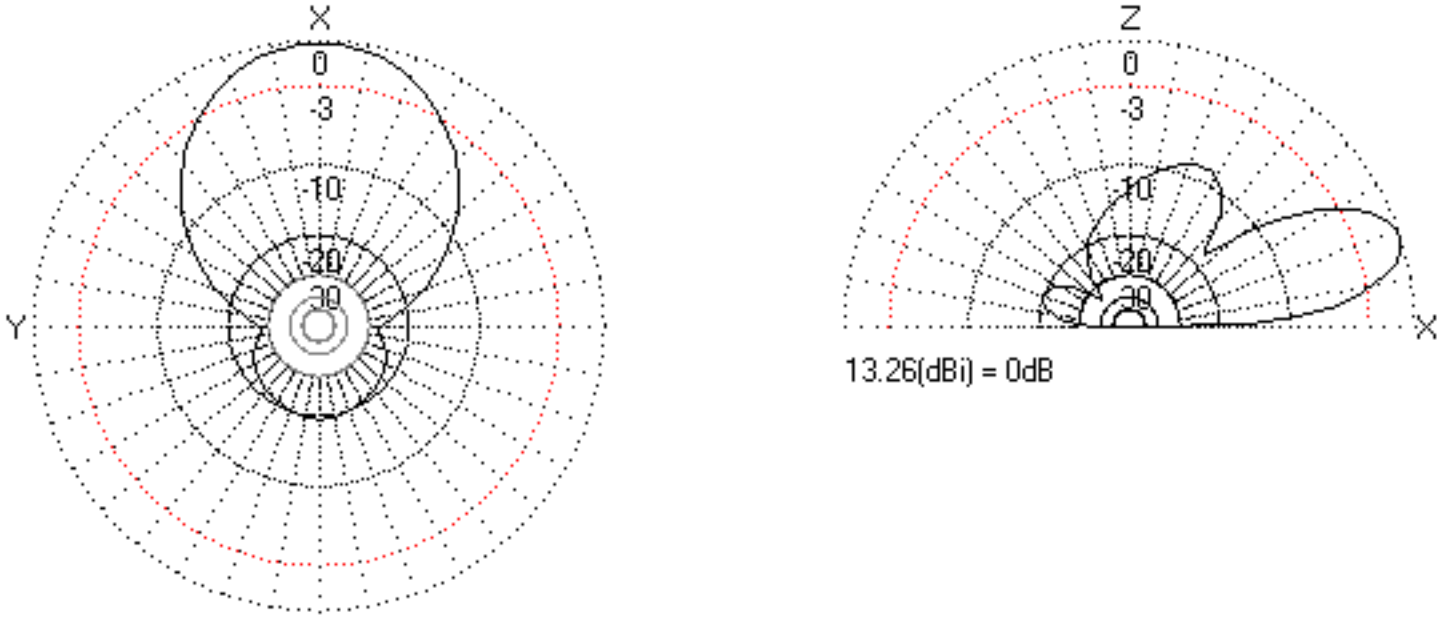
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



13.26(dBi) = 0dB

Order

Evolution value

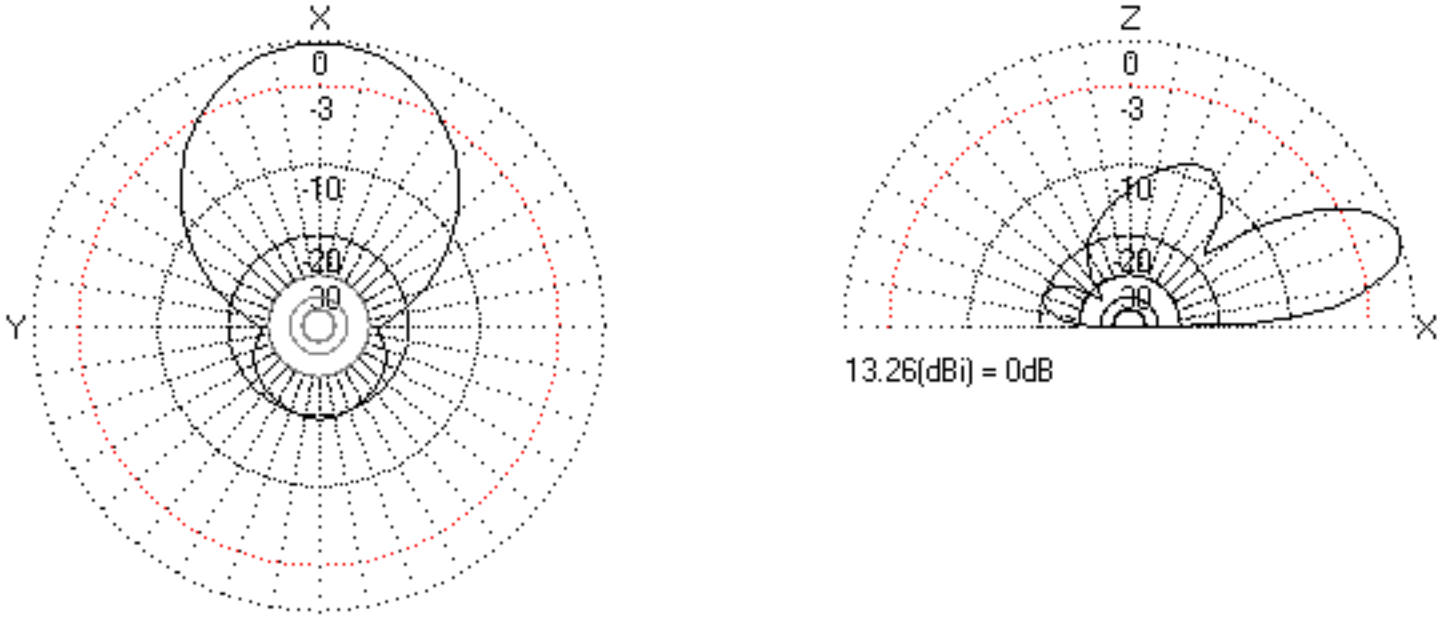
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0
30	29.3 + j1.91	1.71	12.21	20.86	26.0	10.0



13.26(dBi) = 0dB

Order

Evolution value

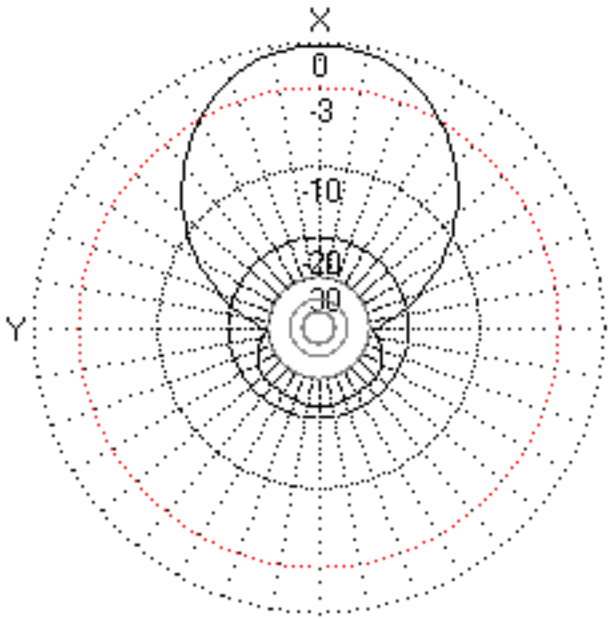
OK

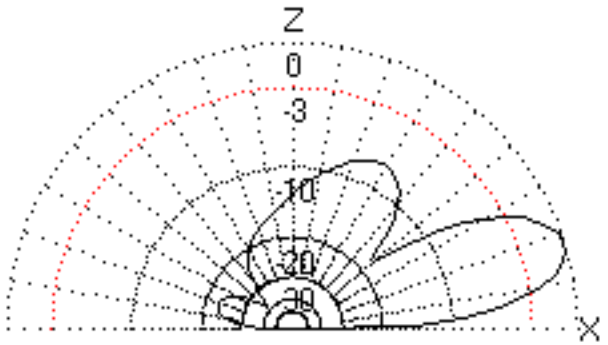
Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0





13.35(dBi) = 0dB

Order

Evolution value

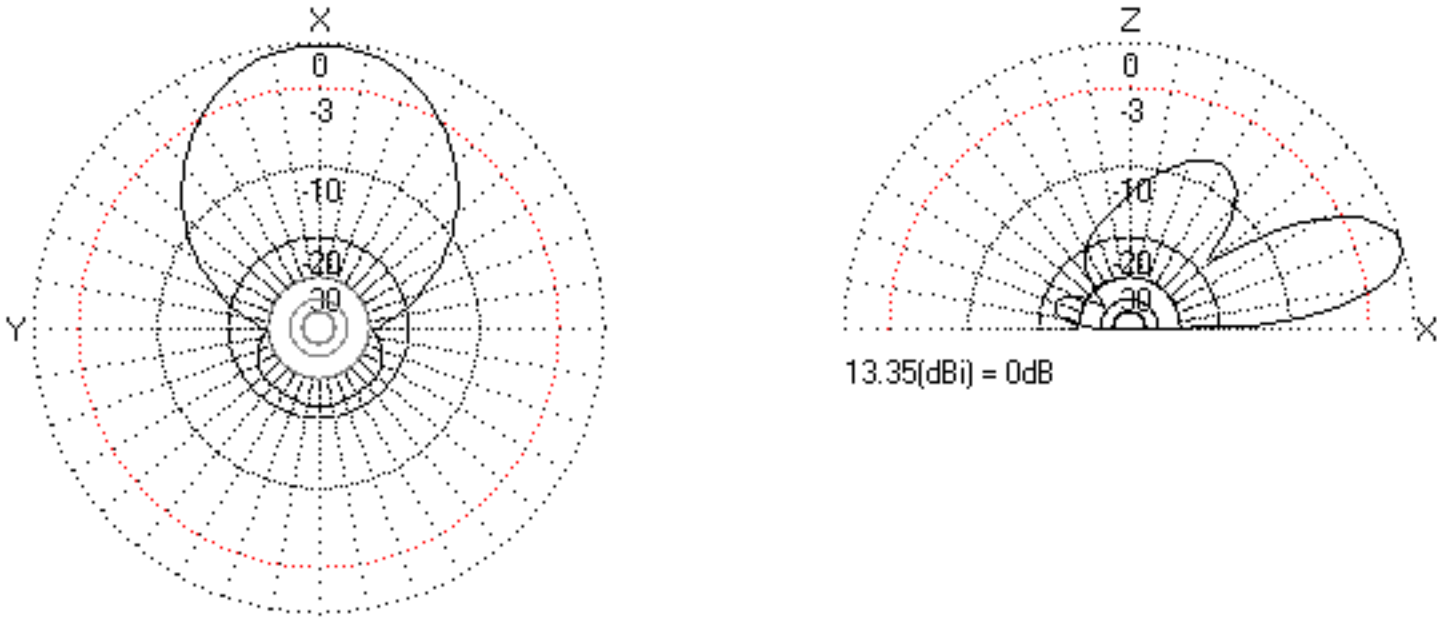
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
24	29.2 - j1.11	1.71	13.35	19.72	17.7	16.0
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0



13.35(dBi) = 0dB

Order

Evolution value

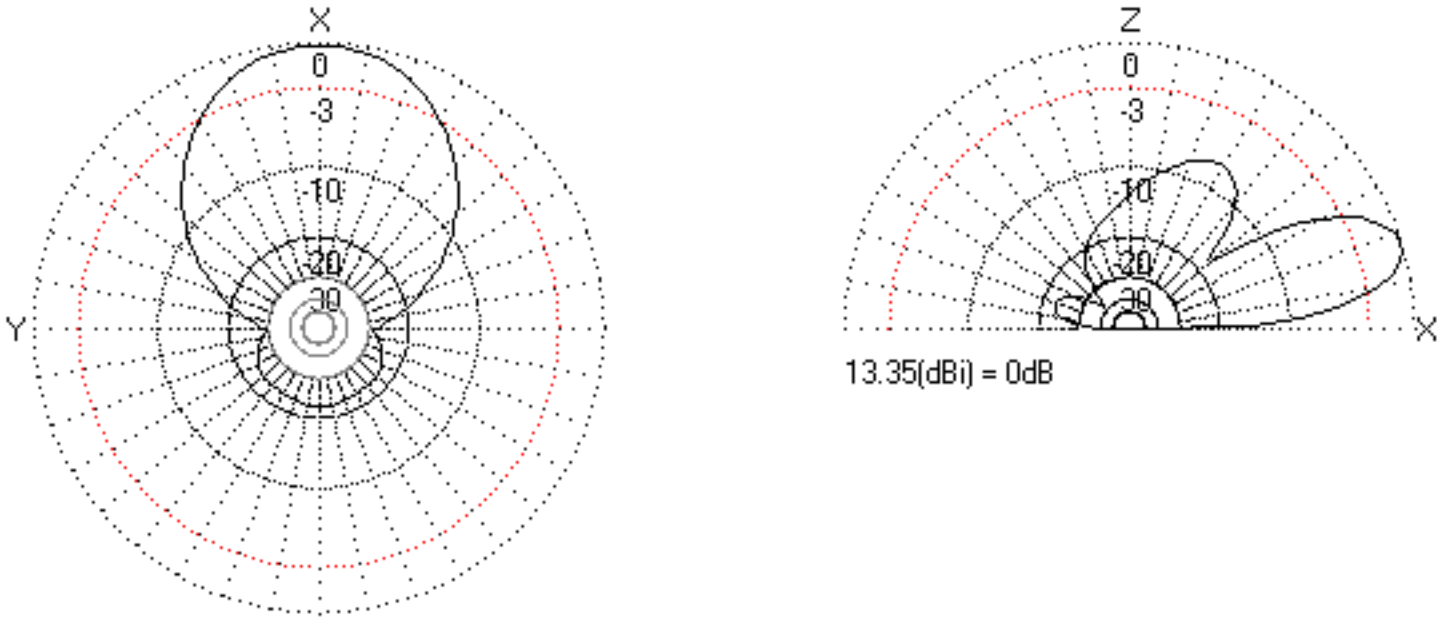
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
24	29.2 - j1.11	1.71	13.35	19.72	17.7	16.0
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0
29	29.9 + j1.82	1.68	12.56	19.51	24.3	11.0



13.35(dBi) = 0dB

Order

Evolution value

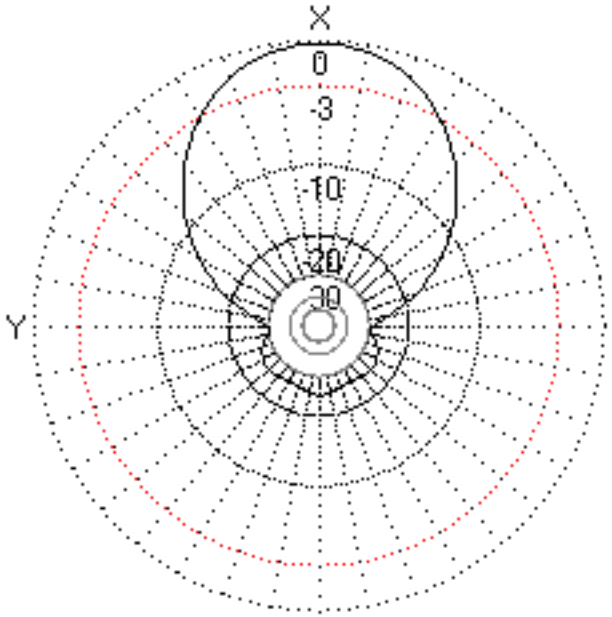
OK

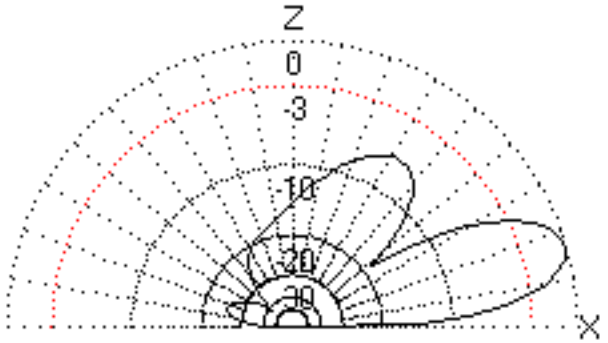
Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
23	28.6 - j0.6	1.75	13.42	20.23	16.8	17.0
24	29.2 - j1.11	1.71	13.35	19.72	17.7	16.0
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0





13.42(dBi) = 0dB

Order

Evolution value

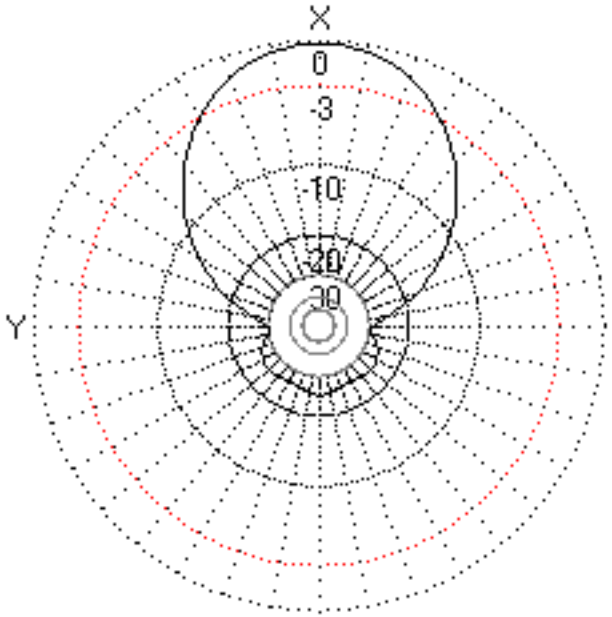
OK

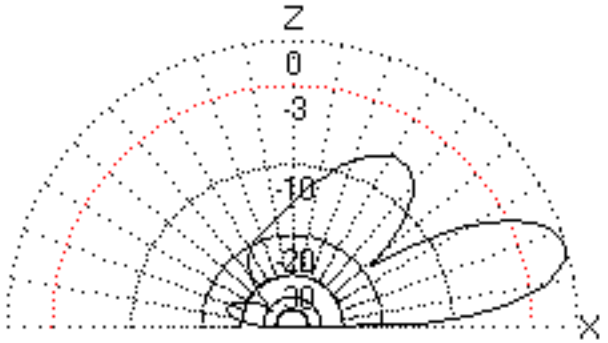
Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
23	28.6 - j0.6	1.75	13.42	20.23	16.8	17.0
24	29.2 - j1.11	1.71	13.35	19.72	17.7	16.0
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0





13.42(dBi) = 0dB

Order

Evolution value

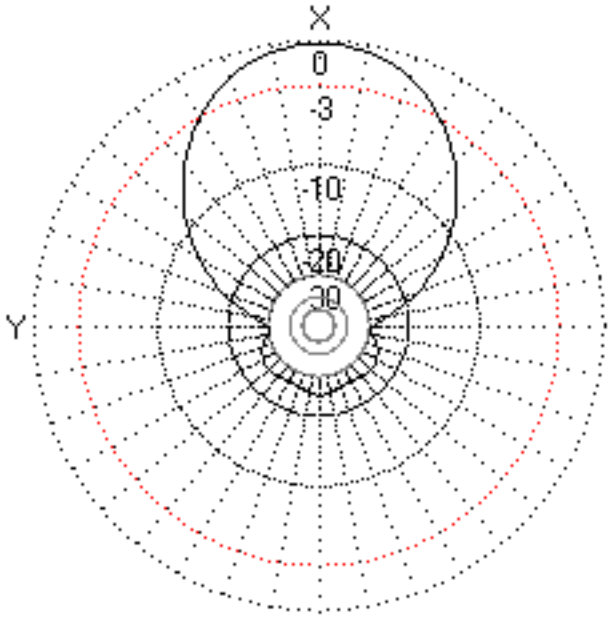
OK

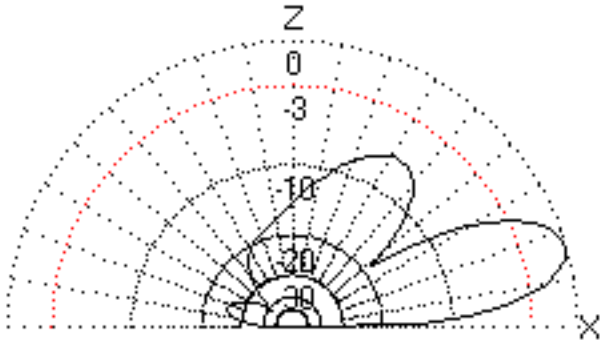
Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
23	28.6 - j0.6	1.75	13.42	20.23	16.8	17.0
24	29.2 - j1.11	1.71	13.35	19.72	17.7	16.0
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0
28	30.6 + j1.57	1.64	12.84	17.91	22.8	12.0





13.42(dBi) = 0dB

Order

Evolution value

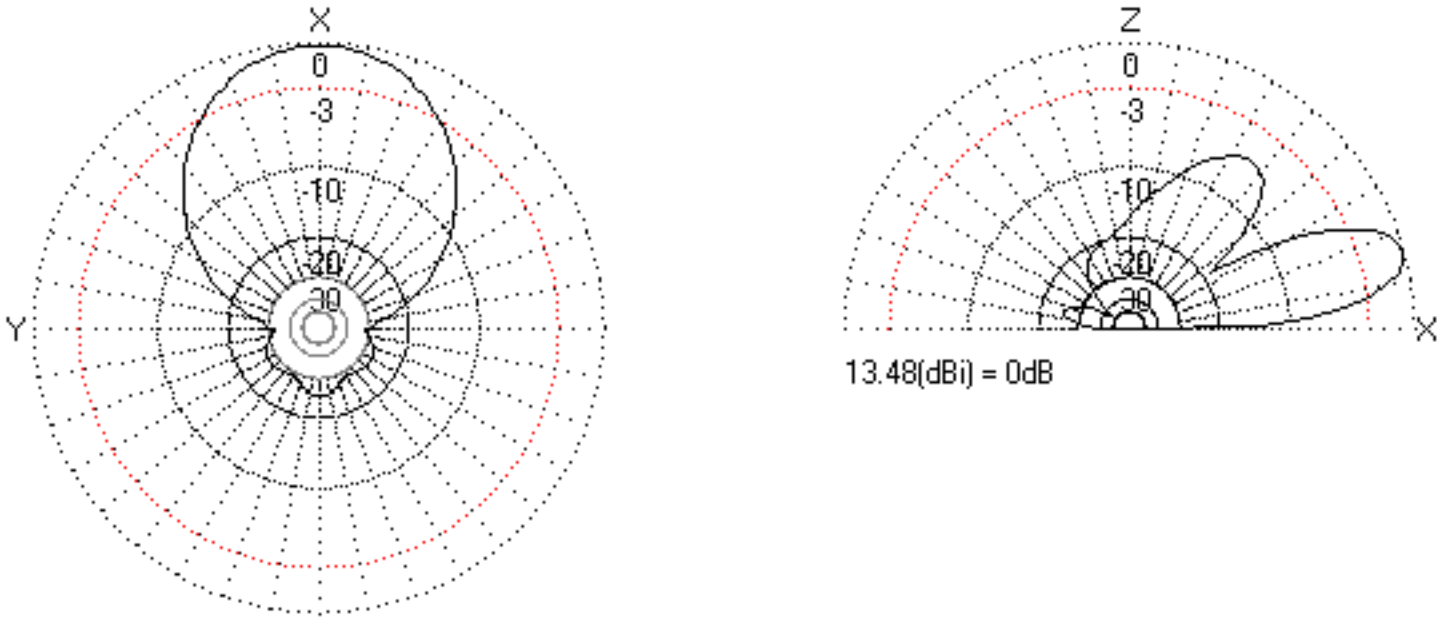
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
22	28.4 + j0.02	1.76	13.48	21.38	15.9	18.0
23	28.6 - j0.6	1.75	13.42	20.23	16.8	17.0
24	29.2 - j1.11	1.71	13.35	19.72	17.7	16.0
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0



13.48(dBi) = 0dB

Order

Evolution value

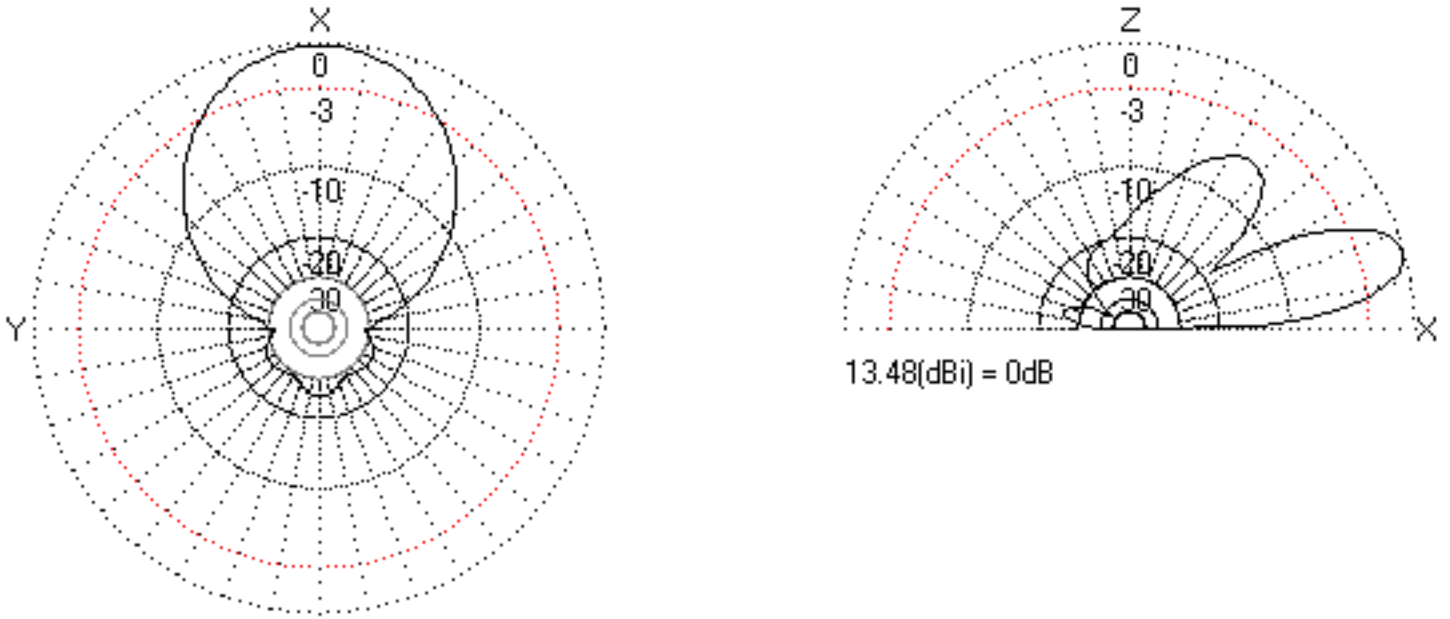
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
22	28.4 + j0.02	1.76	13.48	21.38	15.9	18.0
23	28.6 - j0.6	1.75	13.42	20.23	16.8	17.0
24	29.2 - j1.11	1.71	13.35	19.72	17.7	16.0
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0
27	31.2 + j0.8	1.6	13.03	16.92	21.3	13.0



13.48(dBi) = 0dB

Order

Evolution value

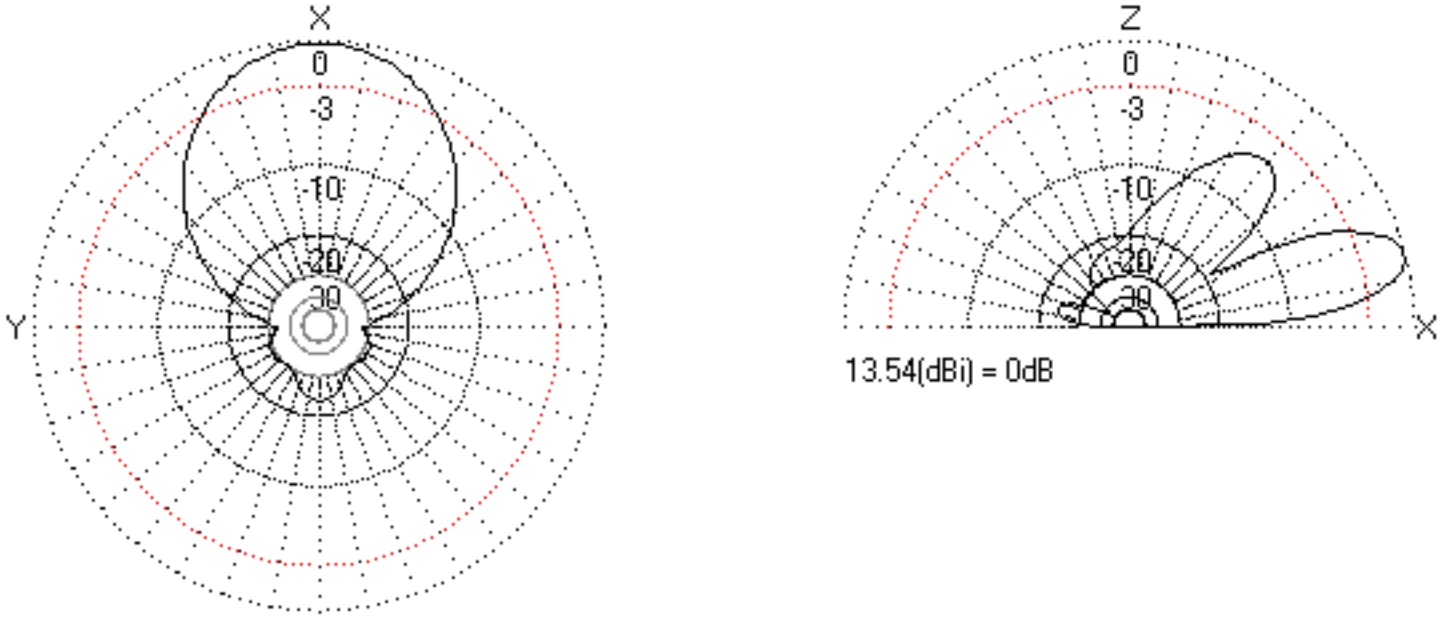
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0
22	28.4 + j0.02	1.76	13.48	21.38	15.9	18.0
23	28.6 - j0.6	1.75	13.42	20.23	16.8	17.0
24	29.2 - j1.11	1.71	13.35	19.72	17.7	16.0
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0



13.54(dBi) = 0dB

Order

Evolution value

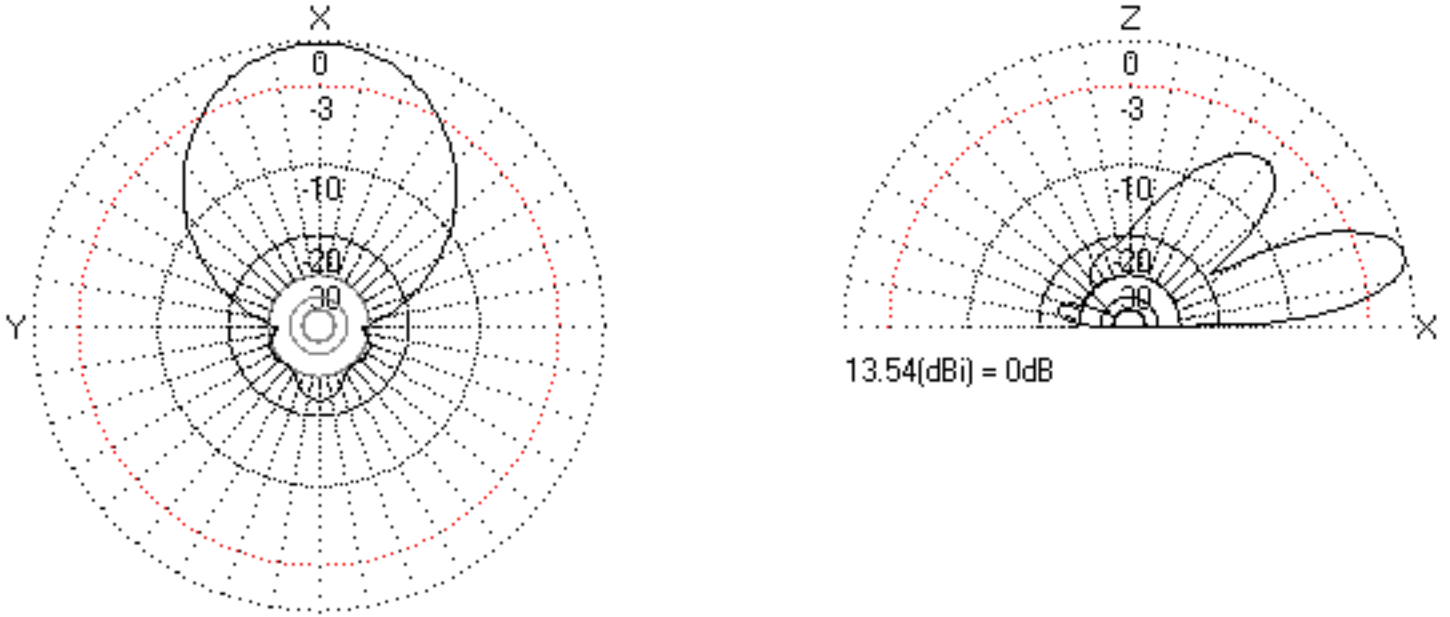
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0
22	28.4 + j0.02	1.76	13.48	21.38	15.9	18.0
23	28.6 - j0.6	1.75	13.42	20.23	16.8	17.0
24	29.2 - j1.11	1.71	13.35	19.72	17.7	16.0
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0



13.54(dBi) = 0dB

Order

Evolution value

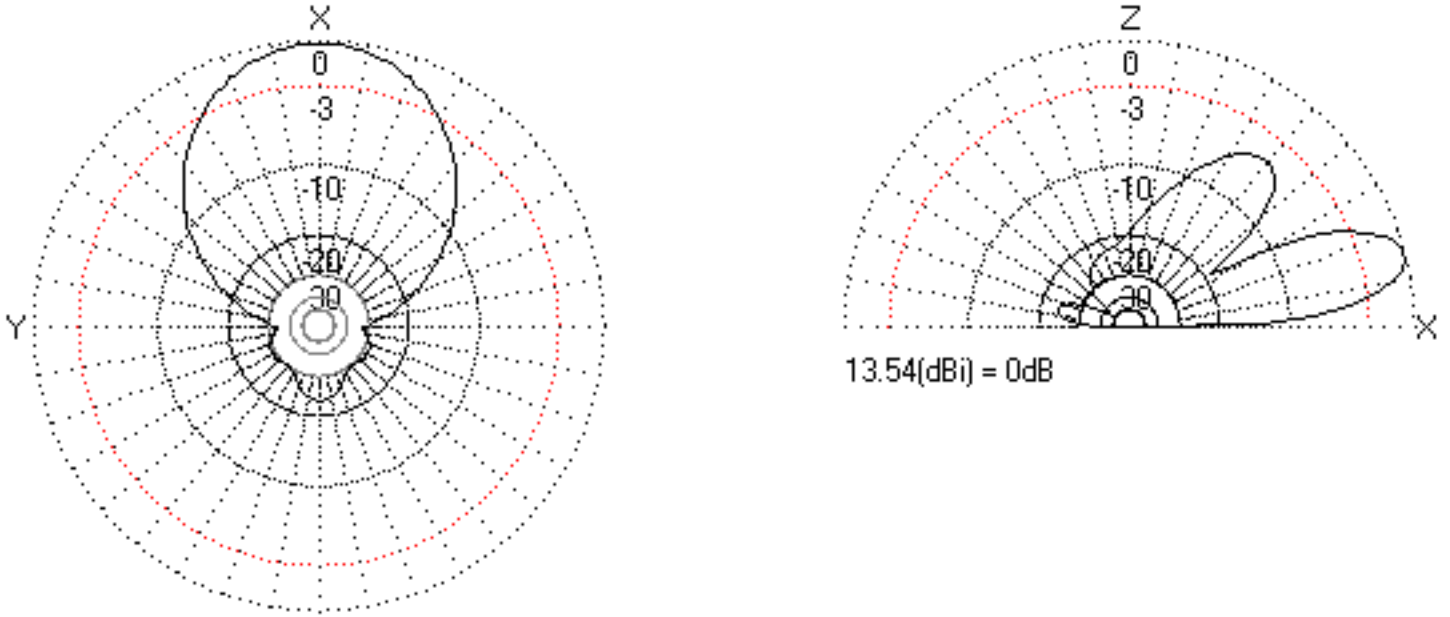
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0
22	28.4 + j0.02	1.76	13.48	21.38	15.9	18.0
23	28.6 - j0.6	1.75	13.42	20.23	16.8	17.0
24	29.2 - j1.11	1.71	13.35	19.72	17.7	16.0
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0
26	31.1 - j0.4	1.61	13.16	17.39	20.0	14.0



13.54(dBi) = 0dB

Order

Evolution value

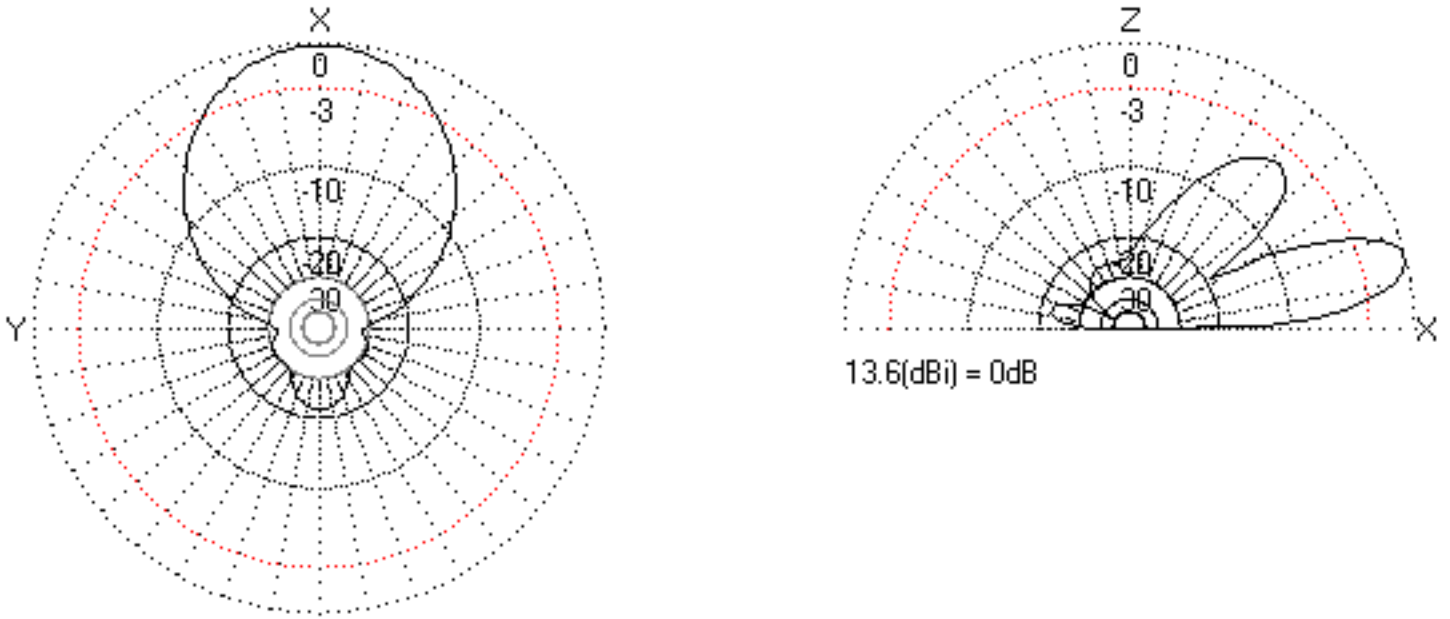
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
20	28.8 + j0.99	1.74	13.6	21.57	14.5	20.0
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0
22	28.4 + j0.02	1.76	13.48	21.38	15.9	18.0
23	28.6 - j0.6	1.75	13.42	20.23	16.8	17.0
24	29.2 - j1.11	1.71	13.35	19.72	17.7	16.0
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0



Order

Evolution value

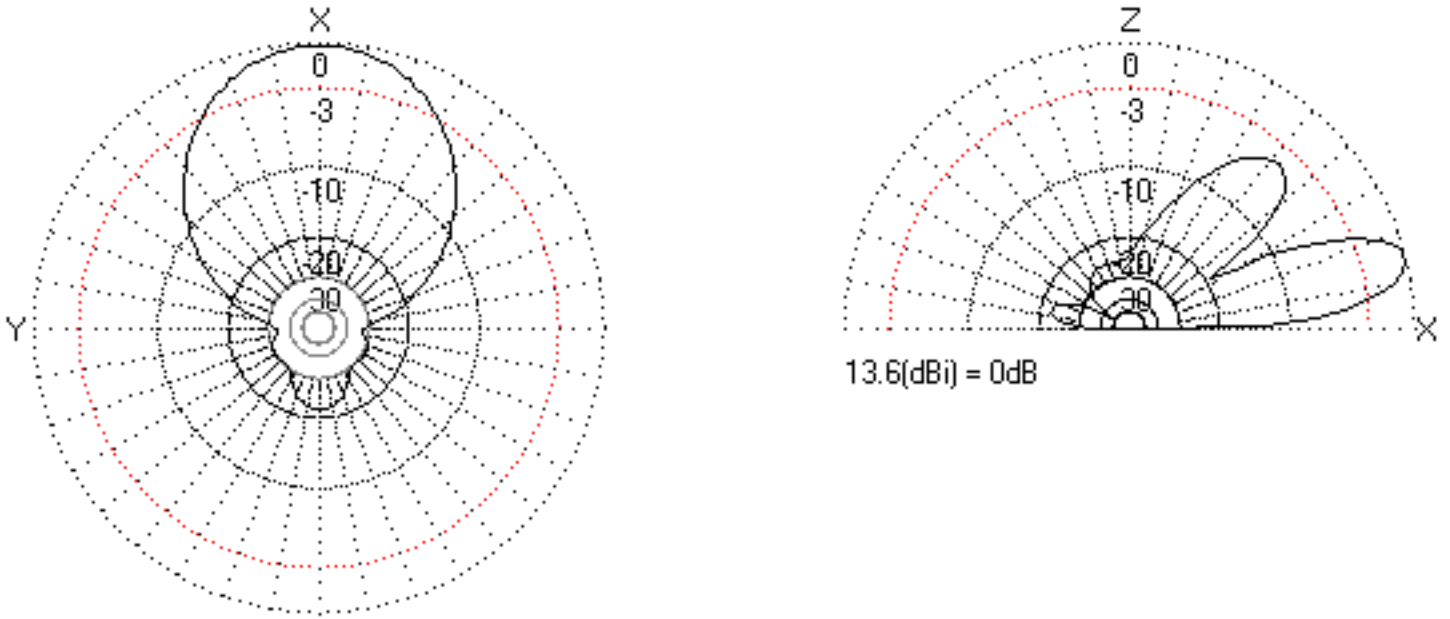
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
20	28.8 + j0.99	1.74	13.6	21.57	14.5	20.0
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0
22	28.4 + j0.02	1.76	13.48	21.38	15.9	18.0
23	28.6 - j0.6	1.75	13.42	20.23	16.8	17.0
24	29.2 - j1.11	1.71	13.35	19.72	17.7	16.0
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0



Order

Evolution value

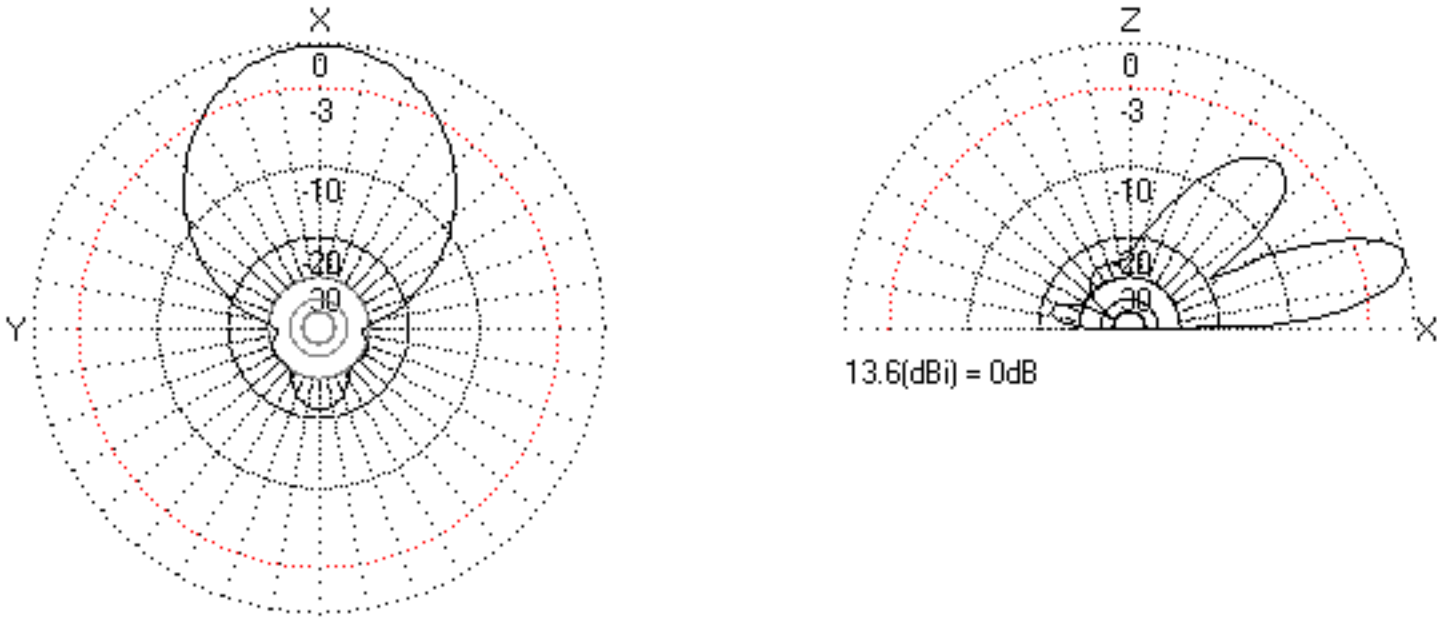
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
20	28.8 + j0.99	1.74	13.6	21.57	14.5	20.0
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0
22	28.4 + j0.02	1.76	13.48	21.38	15.9	18.0
23	28.6 - j0.6	1.75	13.42	20.23	16.8	17.0
24	29.2 - j1.11	1.71	13.35	19.72	17.7	16.0
25	30.2 - j1.15	1.66	13.26	19.33	18.8	15.0



Order

Evolution value

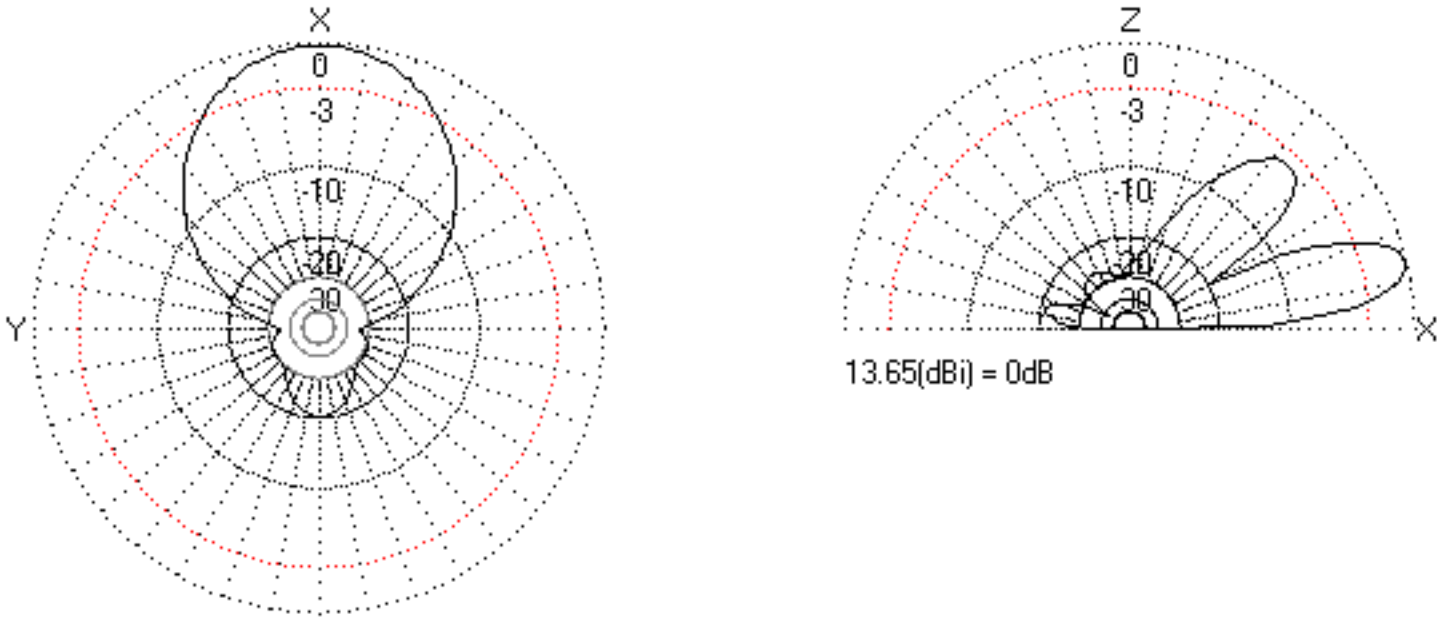
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
19	29.2 + j1.22	1.71	13.65	20.29	13.8	21.0
20	28.8 + j0.99	1.74	13.6	21.57	14.5	20.0
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0
22	28.4 + j0.02	1.76	13.48	21.38	15.9	18.0
23	28.6 - j0.6	1.75	13.42	20.23	16.8	17.0
24	29.2 - j1.11	1.71	13.35	19.72	17.7	16.0



13.65(dBi) = 0dB

Order

Evolution value

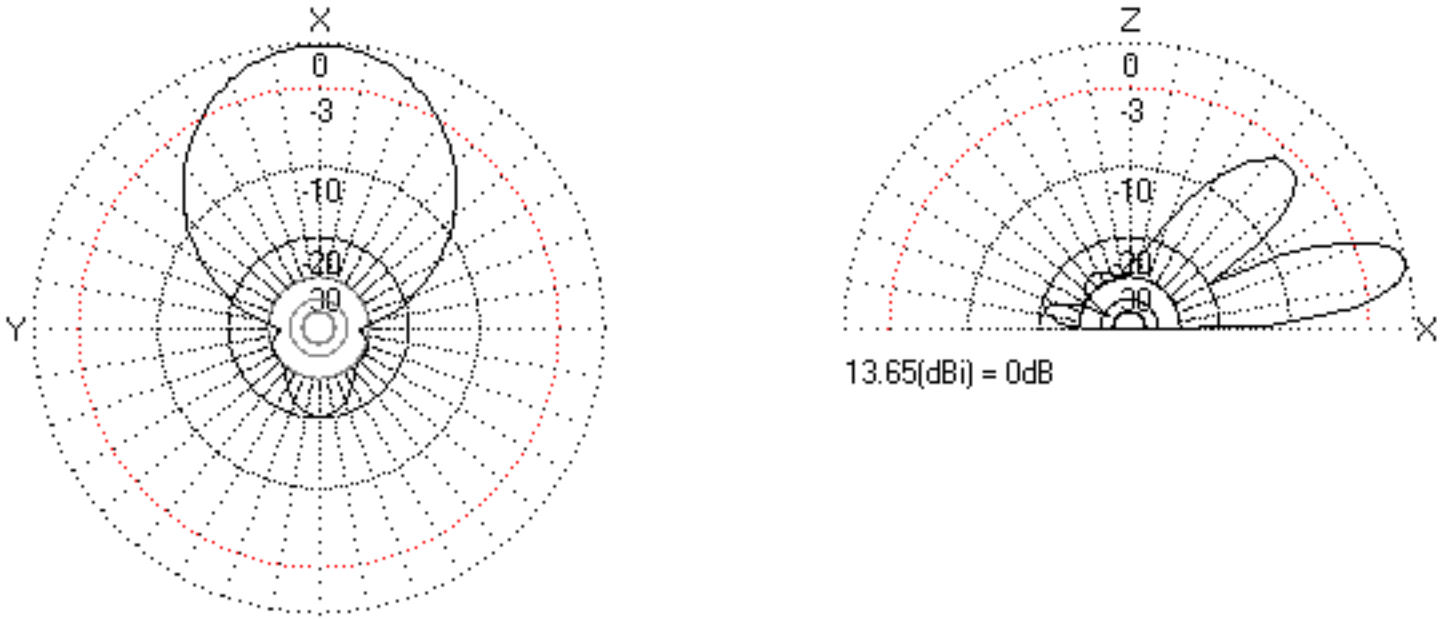
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
19	29.2 + j1.22	1.71	13.65	20.29	13.8	21.0
20	28.8 + j0.99	1.74	13.6	21.57	14.5	20.0
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0
22	28.4 + j0.02	1.76	13.48	21.38	15.9	18.0
23	28.6 - j0.6	1.75	13.42	20.23	16.8	17.0
24	29.2 - j1.11	1.71	13.35	19.72	17.7	16.0



13.65(dBi) = 0dB

Order

Evolution value

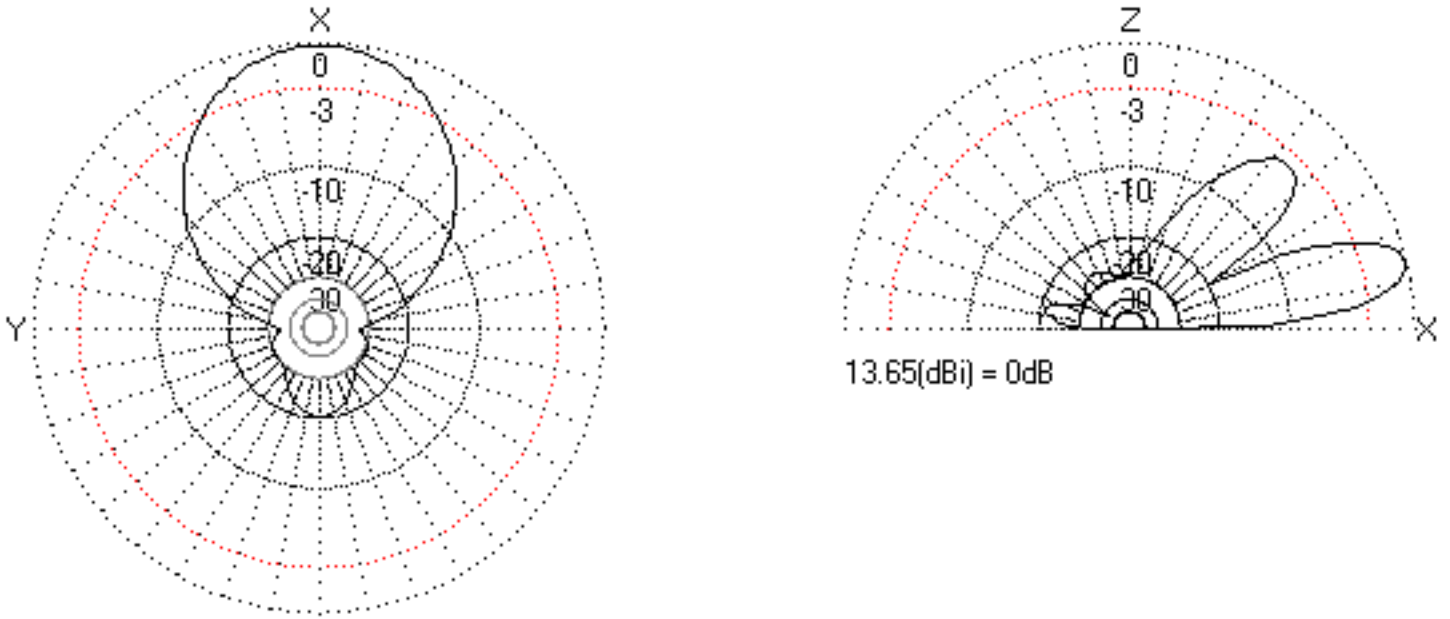
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
19	29.2 + j1.22	1.71	13.65	20.29	13.8	21.0
20	28.8 + j0.99	1.74	13.6	21.57	14.5	20.0
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0
22	28.4 + j0.02	1.76	13.48	21.38	15.9	18.0
23	28.6 - j0.6	1.75	13.42	20.23	16.8	17.0
24	29.2 - j1.11	1.71	13.35	19.72	17.7	16.0



13.65(dBi) = 0dB

Order

Evolution value

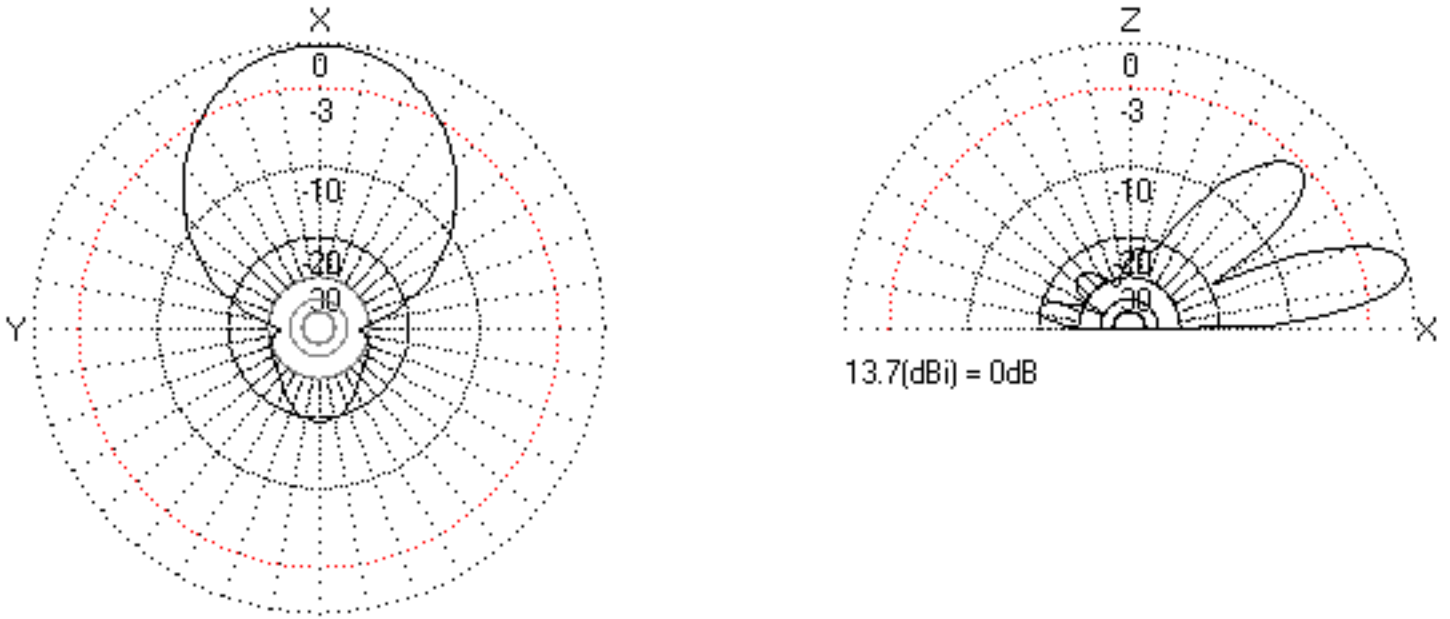
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0
19	29.2 + j1.22	1.71	13.65	20.29	13.8	21.0
20	28.8 + j0.99	1.74	13.6	21.57	14.5	20.0
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0
22	28.4 + j0.02	1.76	13.48	21.38	15.9	18.0
23	28.6 - j0.6	1.75	13.42	20.23	16.8	17.0



13.7(dBi) = 0dB

Order

Evolution value

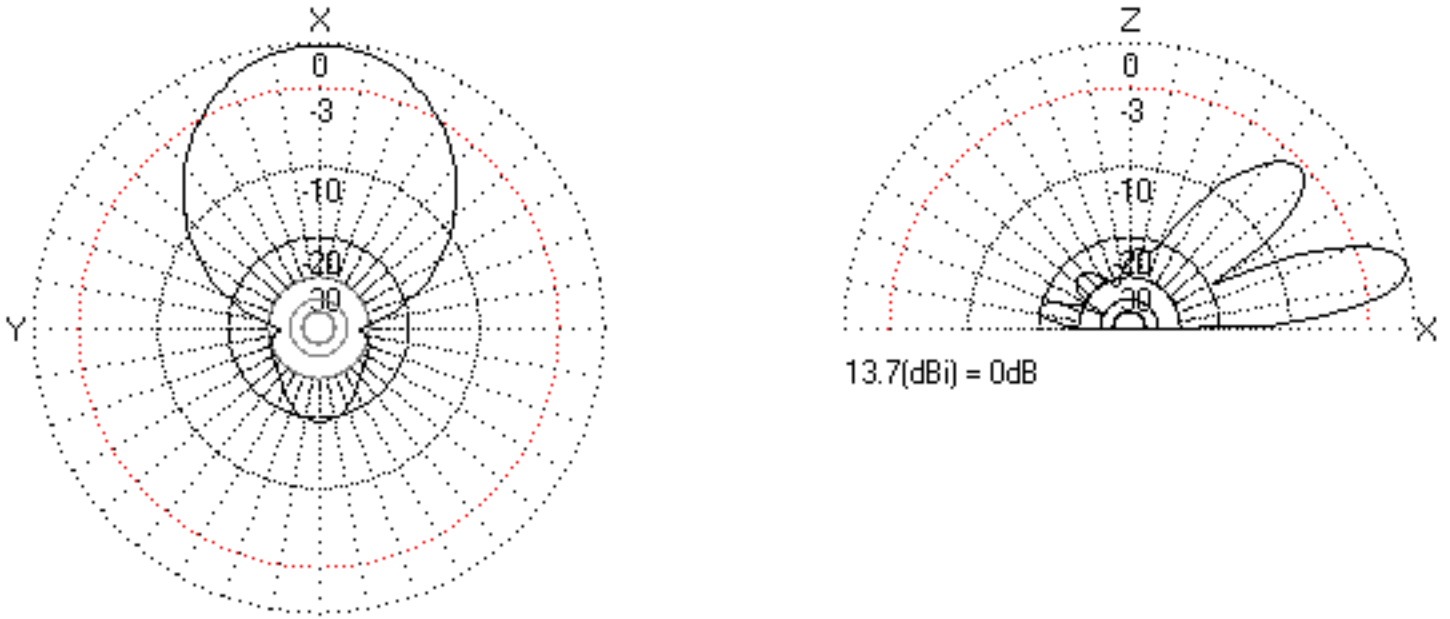
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0
19	29.2 + j1.22	1.71	13.65	20.29	13.8	21.0
20	28.8 + j0.99	1.74	13.6	21.57	14.5	20.0
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0
22	28.4 + j0.02	1.76	13.48	21.38	15.9	18.0
23	28.6 - j0.6	1.75	13.42	20.23	16.8	17.0



13.7(dBi) = 0dB

Order

Evolution value

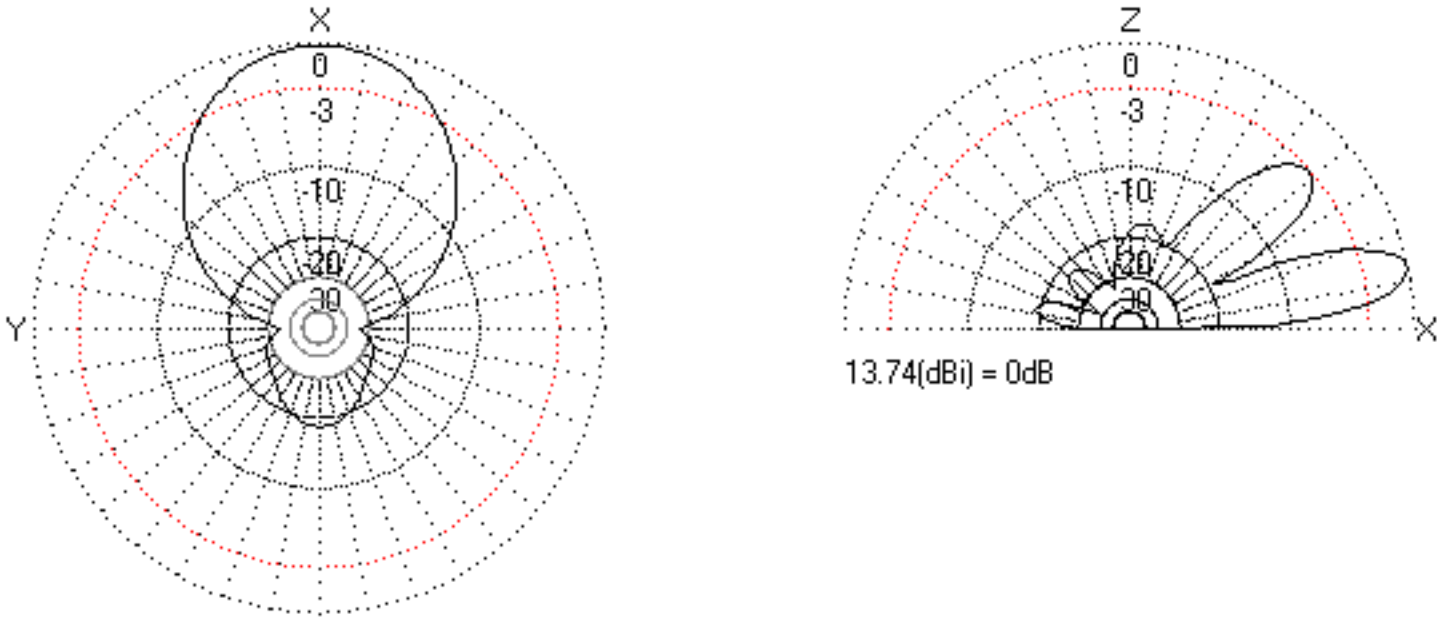
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0
19	29.2 + j1.22	1.71	13.65	20.29	13.8	21.0
20	28.8 + j0.99	1.74	13.6	21.57	14.5	20.0
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0
22	28.4 + j0.02	1.76	13.48	21.38	15.9	18.0



13.74(dBi) = 0dB

Order

Evolution value

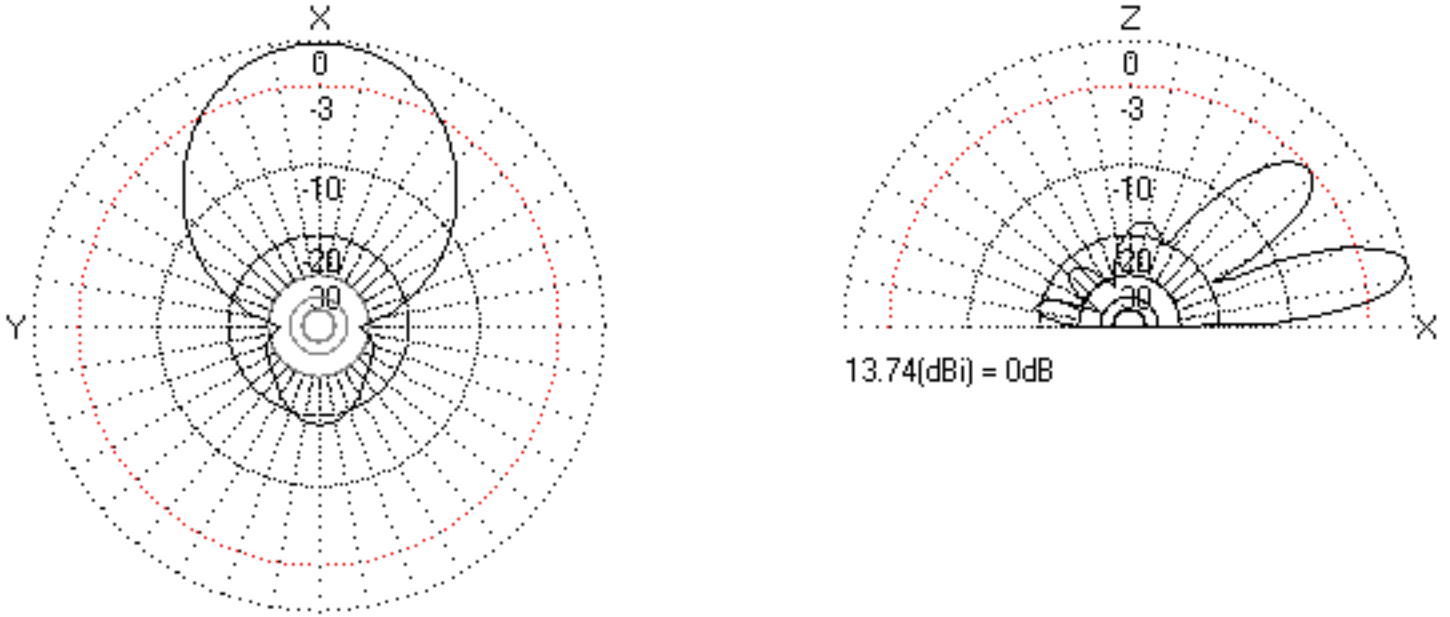
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
17	30.2 + j0.98	1.66	13.74	18.41	12.7	23.0
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0
19	29.2 + j1.22	1.71	13.65	20.29	13.8	21.0
20	28.8 + j0.99	1.74	13.6	21.57	14.5	20.0
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0
22	28.4 + j0.02	1.76	13.48	21.38	15.9	18.0



13.74(dBi) = 0dB

Order

Evolution value

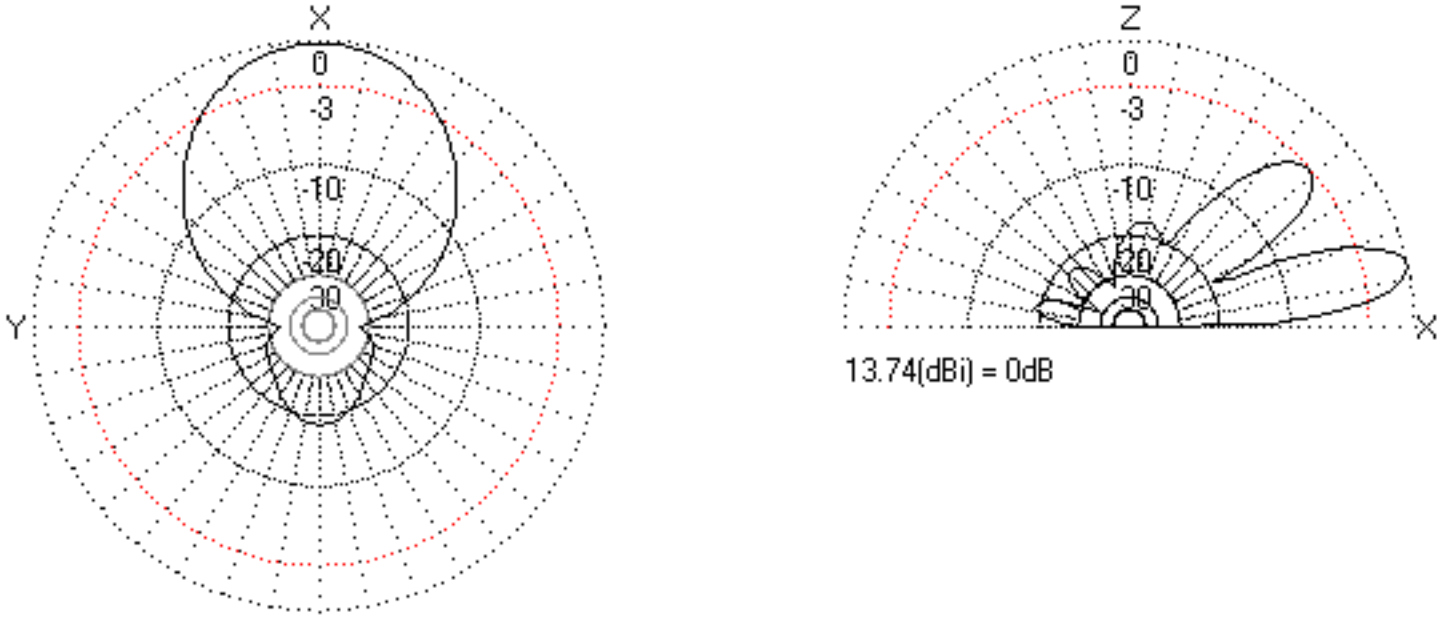
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
17	30.2 + j0.98	1.66	13.74	18.41	12.7	23.0
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0
19	29.2 + j1.22	1.71	13.65	20.29	13.8	21.0
20	28.8 + j0.99	1.74	13.6	21.57	14.5	20.0
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0
22	28.4 + j0.02	1.76	13.48	21.38	15.9	18.0



13.74(dBi) = 0dB

Order

Evolution value

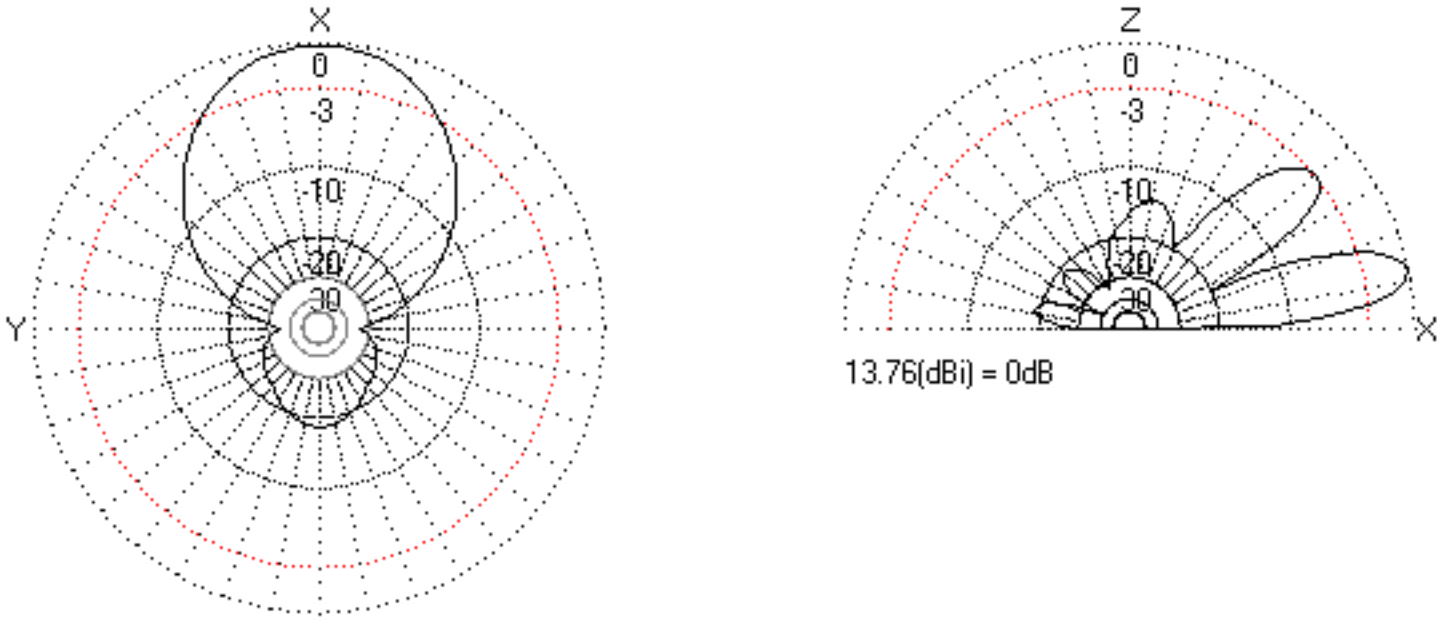
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
16	30.4 + j0.45	1.64	13.76	18.23	12.2	24.0
17	30.2 + j0.98	1.66	13.74	18.41	12.7	23.0
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0
19	29.2 + j1.22	1.71	13.65	20.29	13.8	21.0
20	28.8 + j0.99	1.74	13.6	21.57	14.5	20.0
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0



13.76(dBi) = 0dB

Order

Evolution value

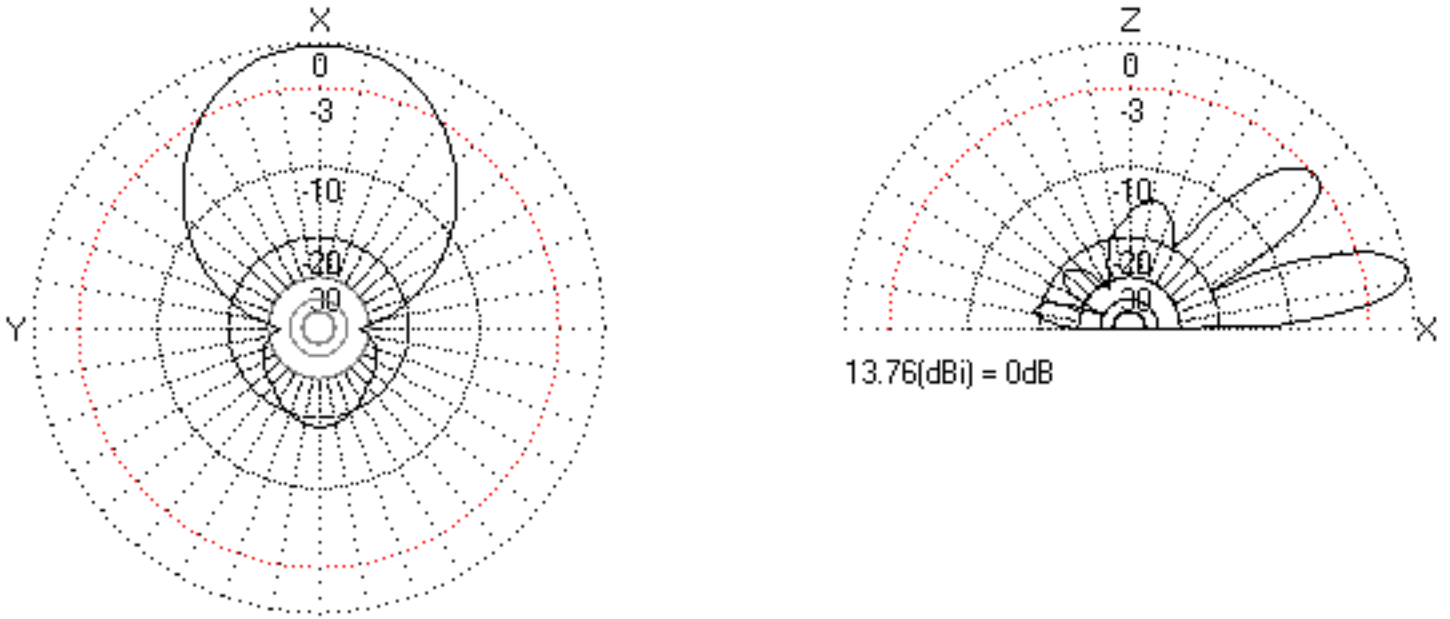
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
16	30.4 + j0.45	1.64	13.76	18.23	12.2	24.0
17	30.2 + j0.98	1.66	13.74	18.41	12.7	23.0
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0
19	29.2 + j1.22	1.71	13.65	20.29	13.8	21.0
20	28.8 + j0.99	1.74	13.6	21.57	14.5	20.0
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0



13.76(dBi) = 0dB

Order

Evolution value

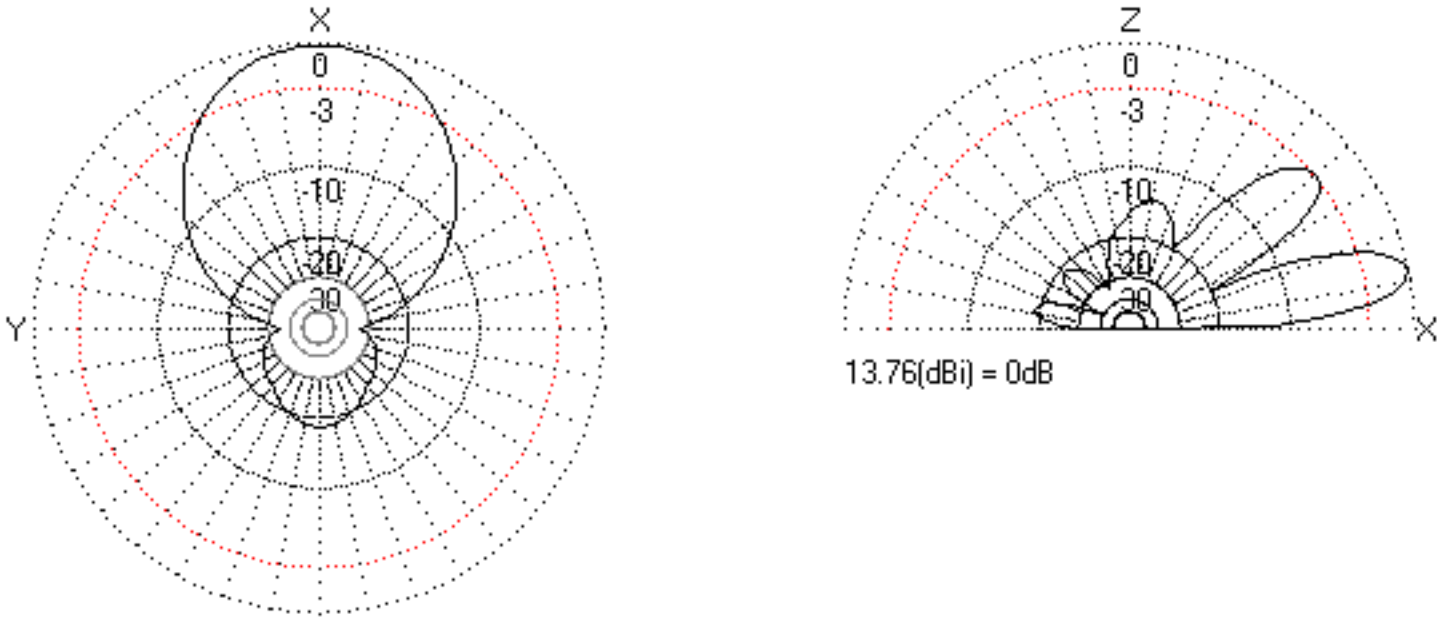
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
16	30.4 + j0.45	1.64	13.76	18.23	12.2	24.0
17	30.2 + j0.98	1.66	13.74	18.41	12.7	23.0
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0
19	29.2 + j1.22	1.71	13.65	20.29	13.8	21.0
20	28.8 + j0.99	1.74	13.6	21.57	14.5	20.0
21	28.5 + j0.58	1.76	13.54	22.85	15.2	19.0



13.76(dBi) = 0dB

Order

Evolution value

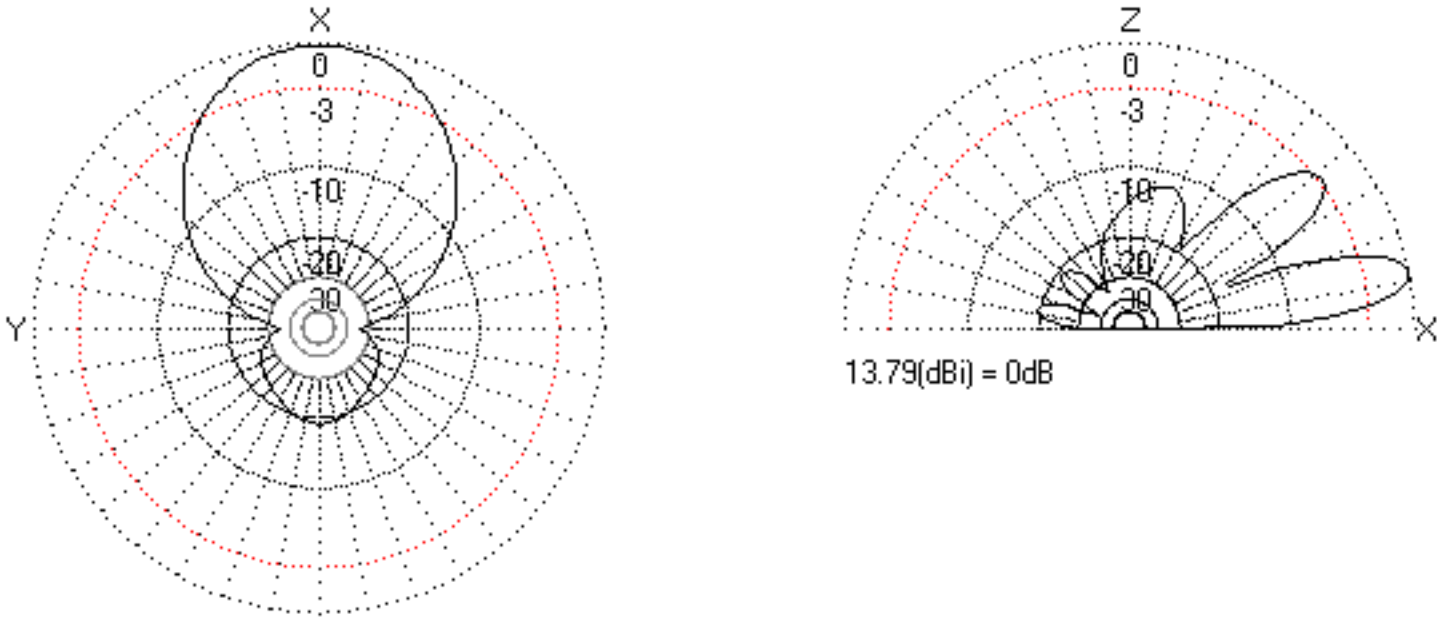
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
15	30.3 - j0.13	1.65	13.79	18.86	11.7	25.0
16	30.4 + j0.45	1.64	13.76	18.23	12.2	24.0
17	30.2 + j0.98	1.66	13.74	18.41	12.7	23.0
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0
19	29.2 + j1.22	1.71	13.65	20.29	13.8	21.0
20	28.8 + j0.99	1.74	13.6	21.57	14.5	20.0



13.79(dBi) = 0dB

Order

Evolution value

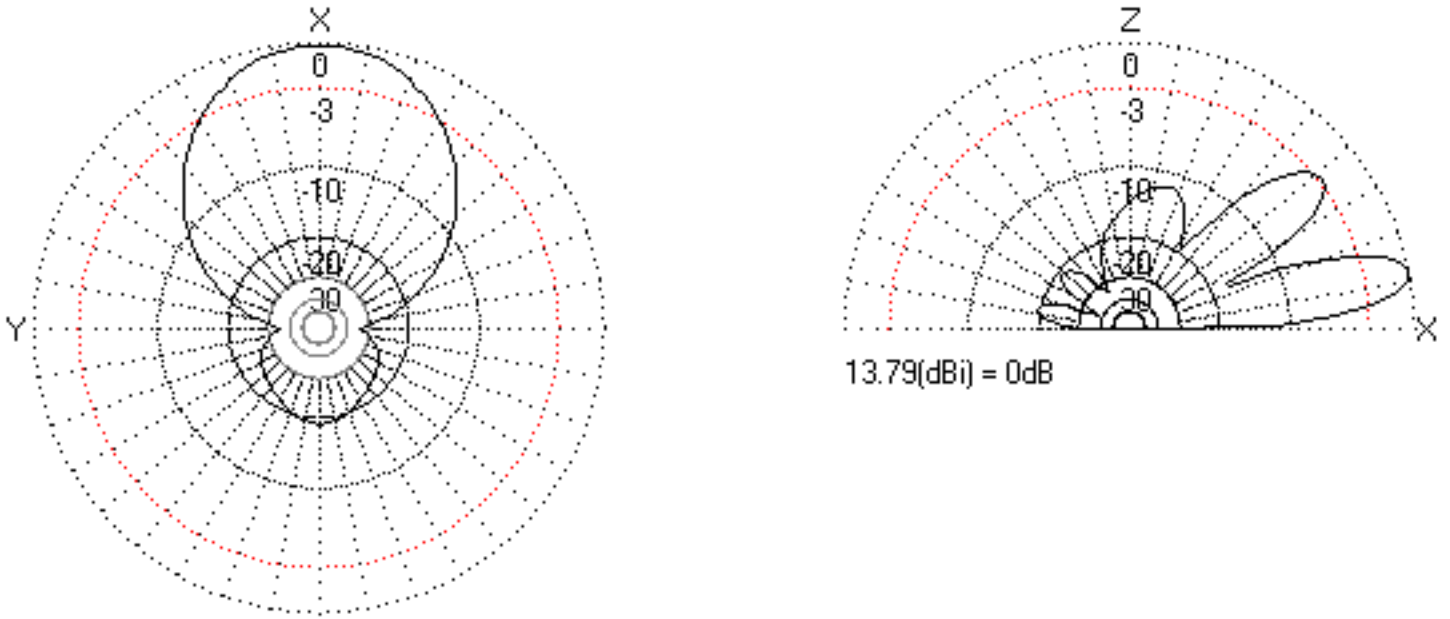
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
15	30.3 - j0.13	1.65	13.79	18.86	11.7	25.0
16	30.4 + j0.45	1.64	13.76	18.23	12.2	24.0
17	30.2 + j0.98	1.66	13.74	18.41	12.7	23.0
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0
19	29.2 + j1.22	1.71	13.65	20.29	13.8	21.0
20	28.8 + j0.99	1.74	13.6	21.57	14.5	20.0



13.79(dBi) = 0dB

Order

Evolution value

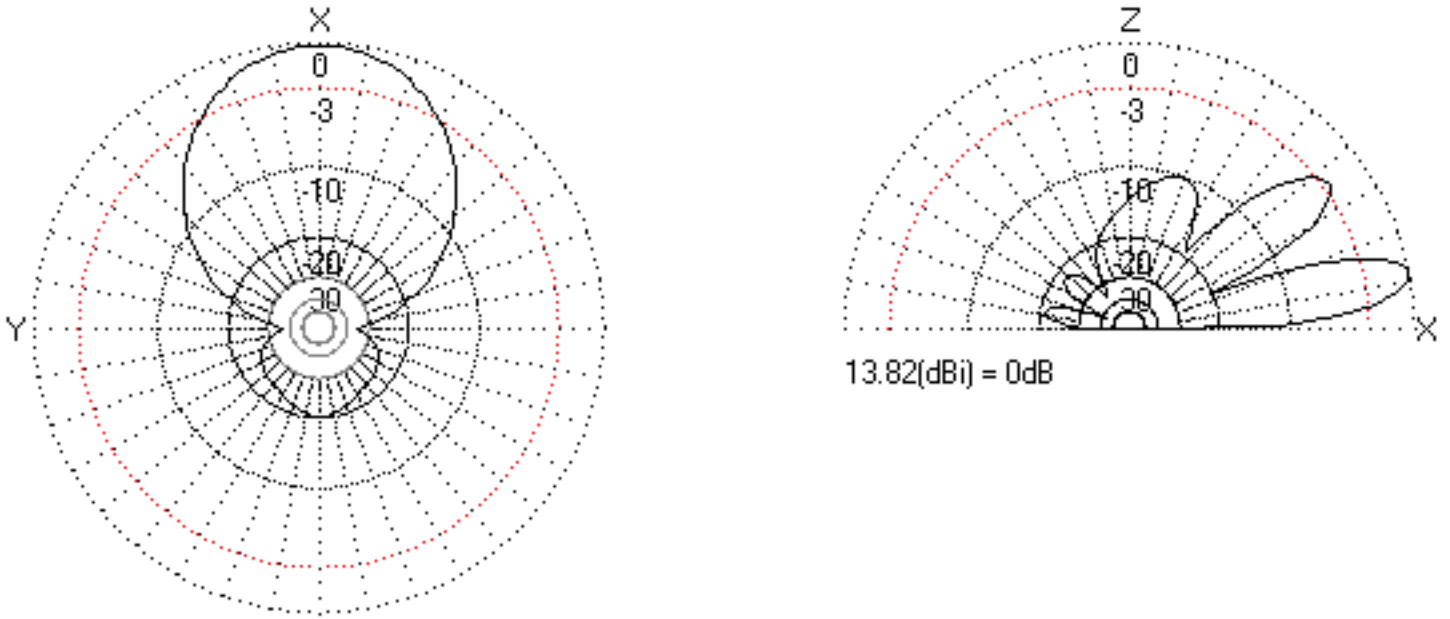
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0
15	30.3 - j0.13	1.65	13.79	18.86	11.7	25.0
16	30.4 + j0.45	1.64	13.76	18.23	12.2	24.0
17	30.2 + j0.98	1.66	13.74	18.41	12.7	23.0
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0
19	29.2 + j1.22	1.71	13.65	20.29	13.8	21.0



13.82(dBi) = 0dB

Order

Evolution value

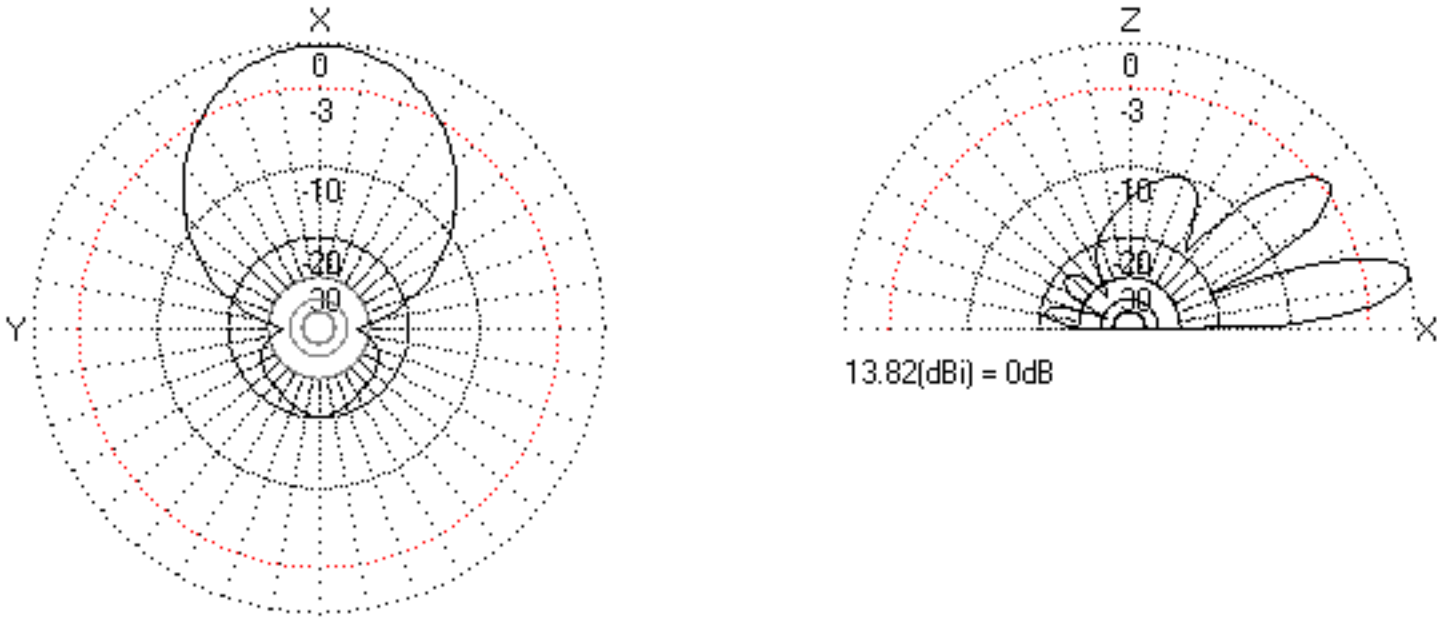
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0
15	30.3 - j0.13	1.65	13.79	18.86	11.7	25.0
16	30.4 + j0.45	1.64	13.76	18.23	12.2	24.0
17	30.2 + j0.98	1.66	13.74	18.41	12.7	23.0
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0
19	29.2 + j1.22	1.71	13.65	20.29	13.8	21.0



13.82(dBi) = 0dB

Order

Evolution value

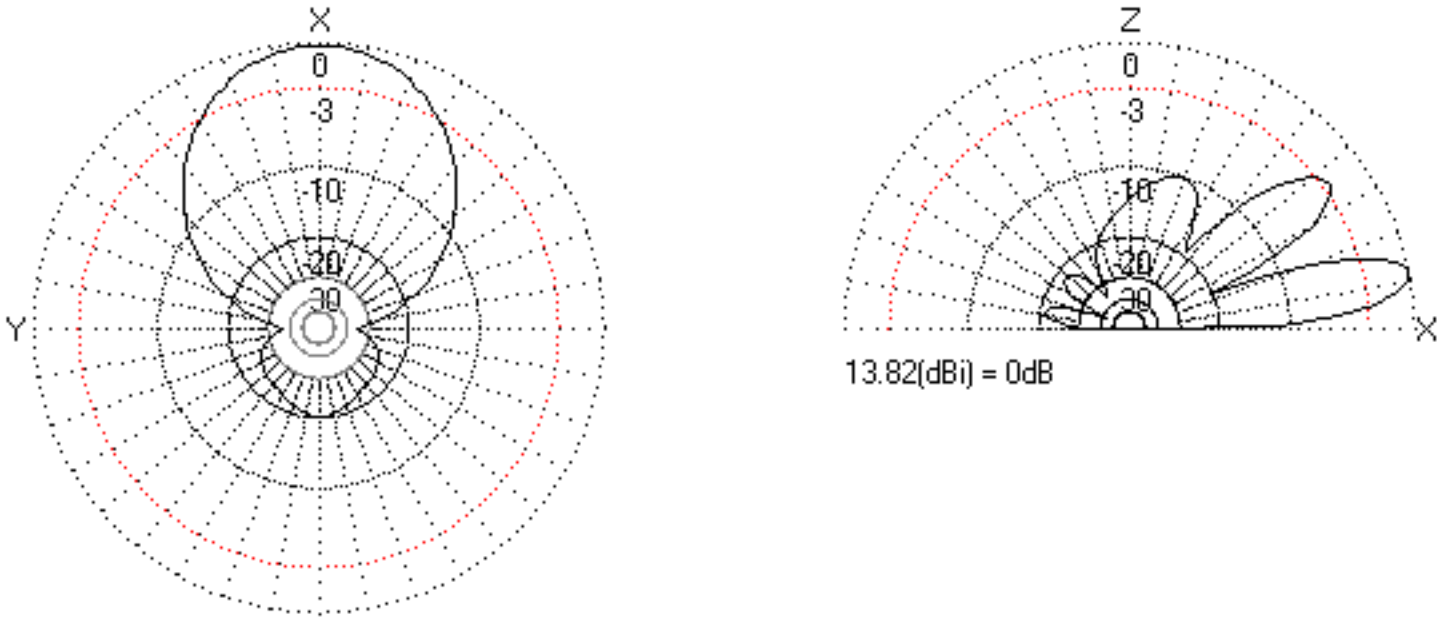
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0
15	30.3 - j0.13	1.65	13.79	18.86	11.7	25.0
16	30.4 + j0.45	1.64	13.76	18.23	12.2	24.0
17	30.2 + j0.98	1.66	13.74	18.41	12.7	23.0
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0
19	29.2 + j1.22	1.71	13.65	20.29	13.8	21.0



13.82(dBi) = 0dB

Order

Evolution value

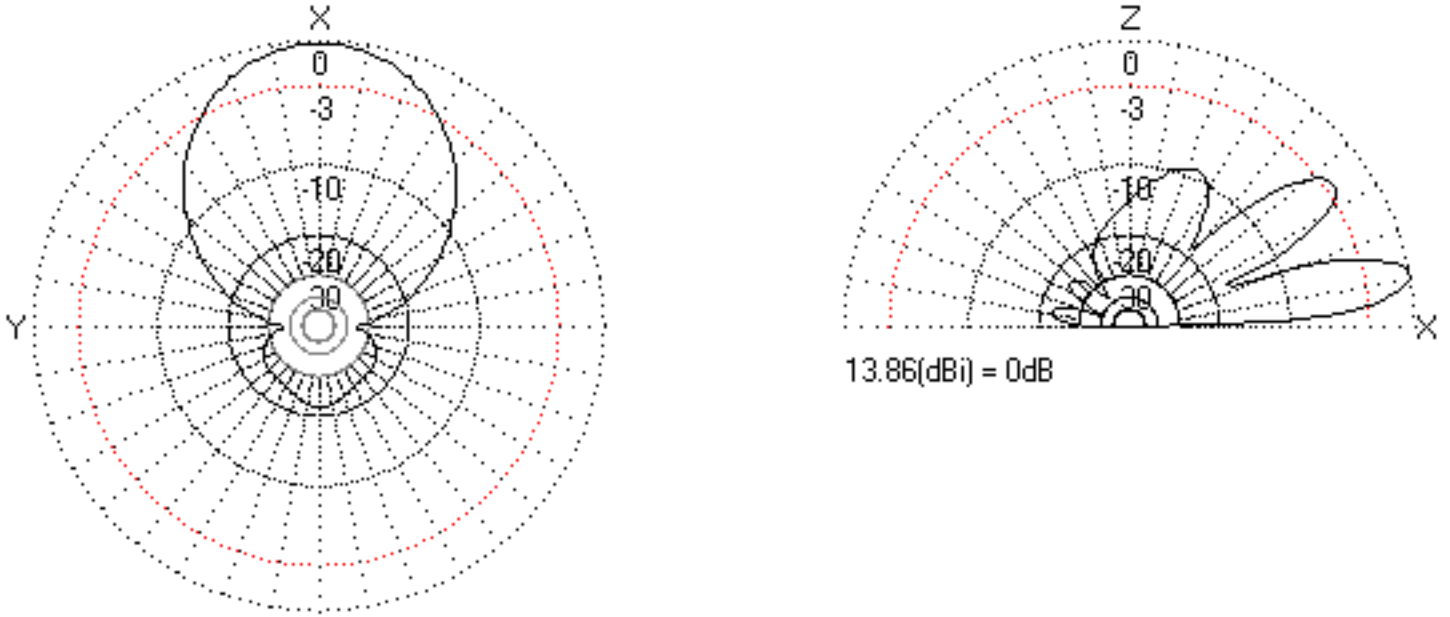
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
13	29.3 - j0.45	1.71	13.86	21.74	10.9	27.0
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0
15	30.3 - j0.13	1.65	13.79	18.86	11.7	25.0
16	30.4 + j0.45	1.64	13.76	18.23	12.2	24.0
17	30.2 + j0.98	1.66	13.74	18.41	12.7	23.0
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0



13.86(dBi) = 0dB

Order

Evolution value

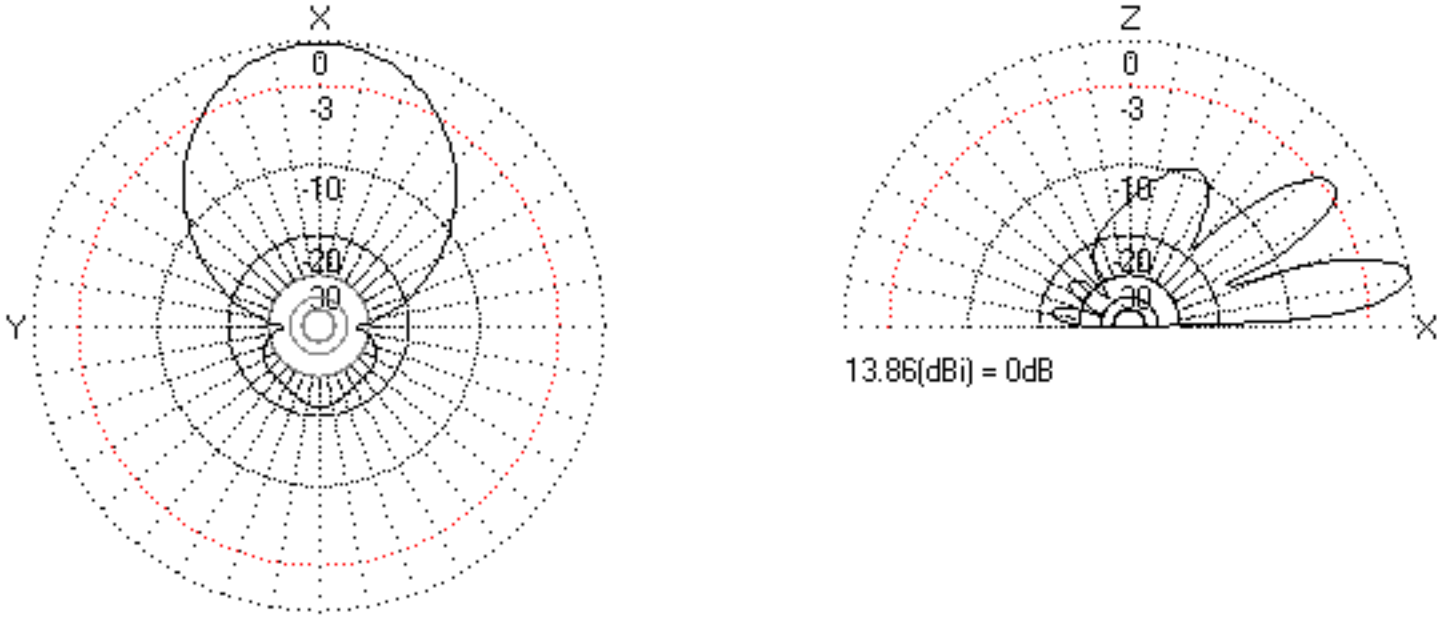
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
13	29.3 - j0.45	1.71	13.86	21.74	10.9	27.0
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0
15	30.3 - j0.13	1.65	13.79	18.86	11.7	25.0
16	30.4 + j0.45	1.64	13.76	18.23	12.2	24.0
17	30.2 + j0.98	1.66	13.74	18.41	12.7	23.0
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0



13.86(dBi) = 0dB

Order

Evolution value

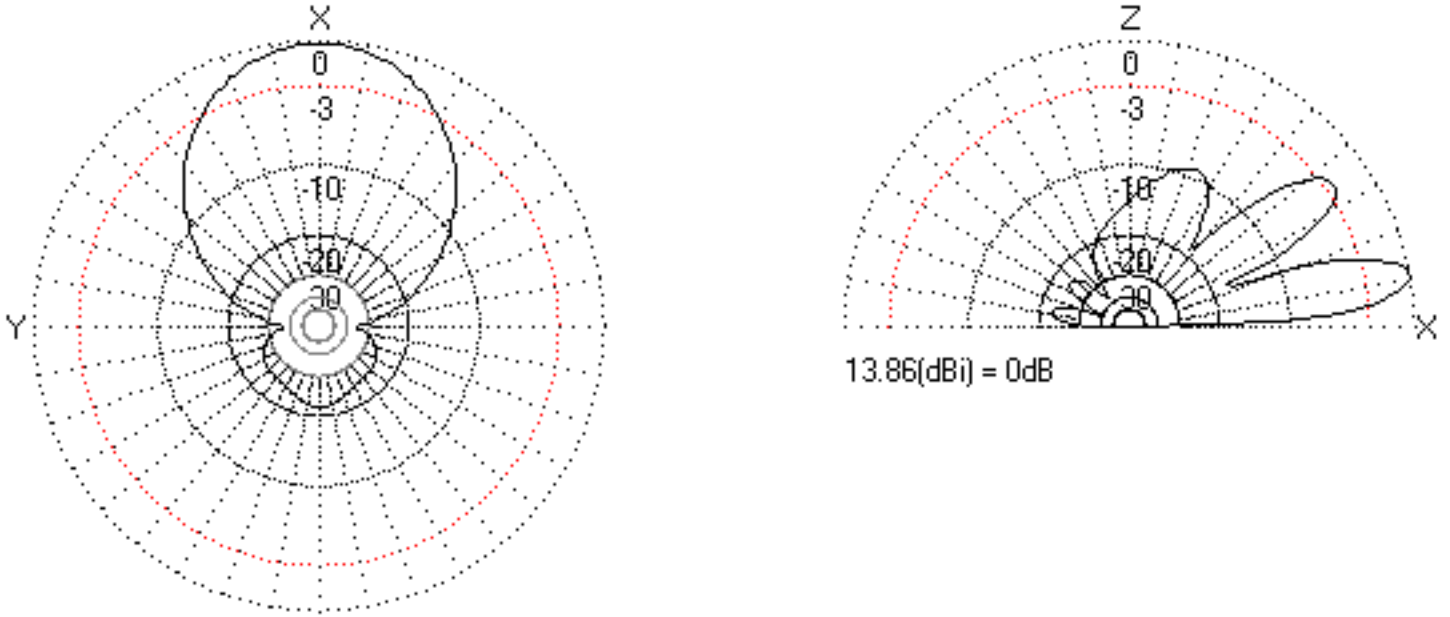
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
13	29.3 - j0.45	1.71	13.86	21.74	10.9	27.0
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0
15	30.3 - j0.13	1.65	13.79	18.86	11.7	25.0
16	30.4 + j0.45	1.64	13.76	18.23	12.2	24.0
17	30.2 + j0.98	1.66	13.74	18.41	12.7	23.0
18	29.7 + j1.23	1.69	13.7	19.18	13.2	22.0



13.86(dBi) = 0dB

Order

Evolution value

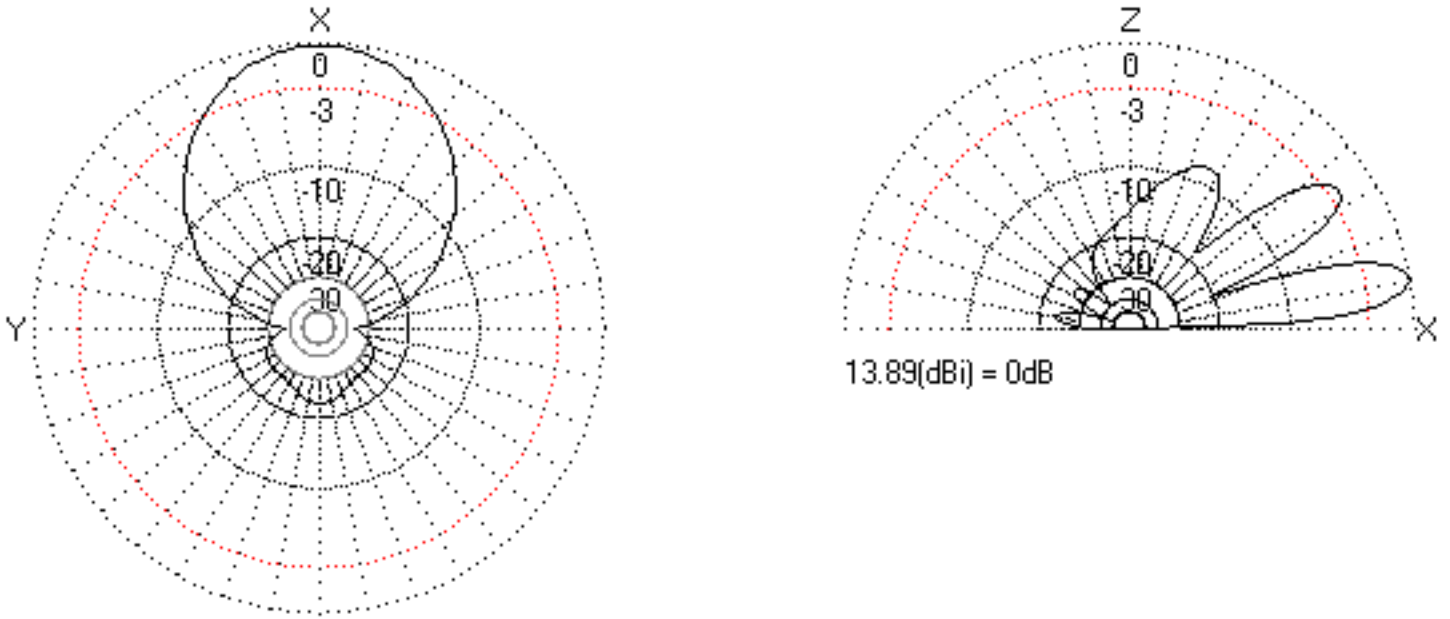
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
12	28.9 - j0.19	1.73	13.89	22.68	10.5	28.0
13	29.3 - j0.45	1.71	13.86	21.74	10.9	27.0
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0
15	30.3 - j0.13	1.65	13.79	18.86	11.7	25.0
16	30.4 + j0.45	1.64	13.76	18.23	12.2	24.0
17	30.2 + j0.98	1.66	13.74	18.41	12.7	23.0



13.89(dBi) = 0dB

Order

Evolution value

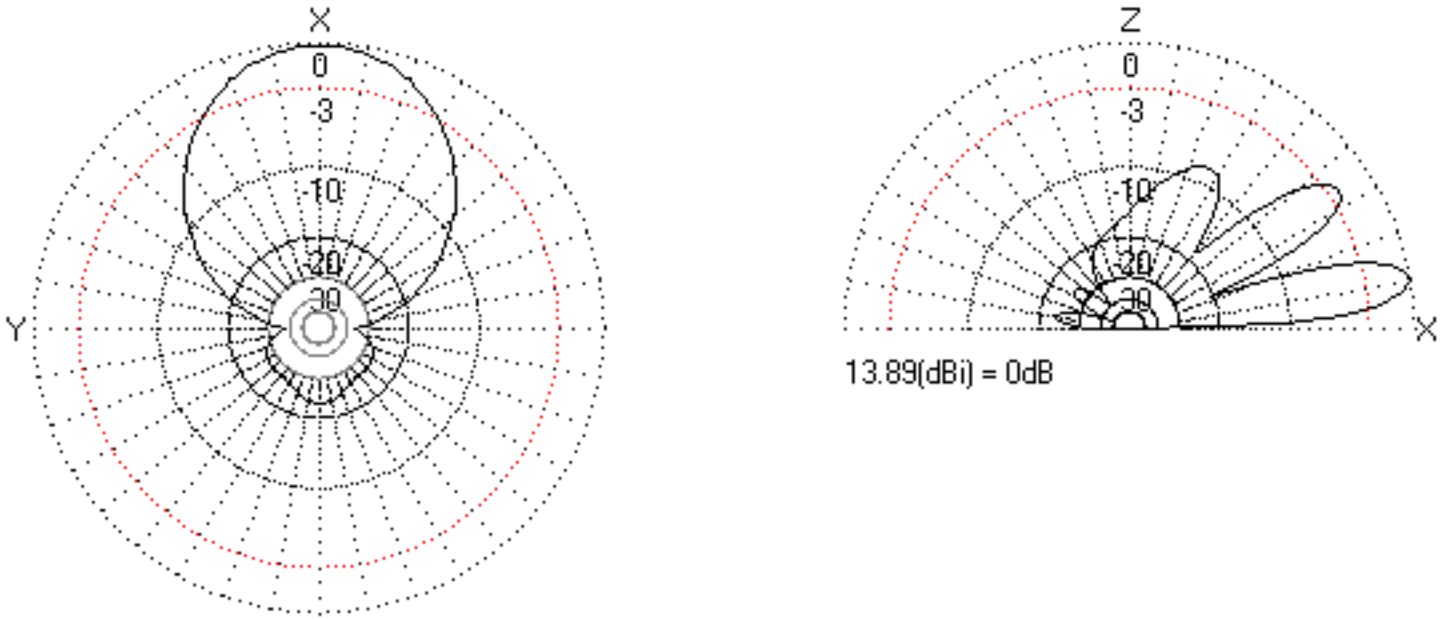
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
12	28.9 - j0.19	1.73	13.89	22.68	10.5	28.0
13	29.3 - j0.45	1.71	13.86	21.74	10.9	27.0
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0
15	30.3 - j0.13	1.65	13.79	18.86	11.7	25.0
16	30.4 + j0.45	1.64	13.76	18.23	12.2	24.0
17	30.2 + j0.98	1.66	13.74	18.41	12.7	23.0



13.89(dBi) = 0dB

Order

Evolution value

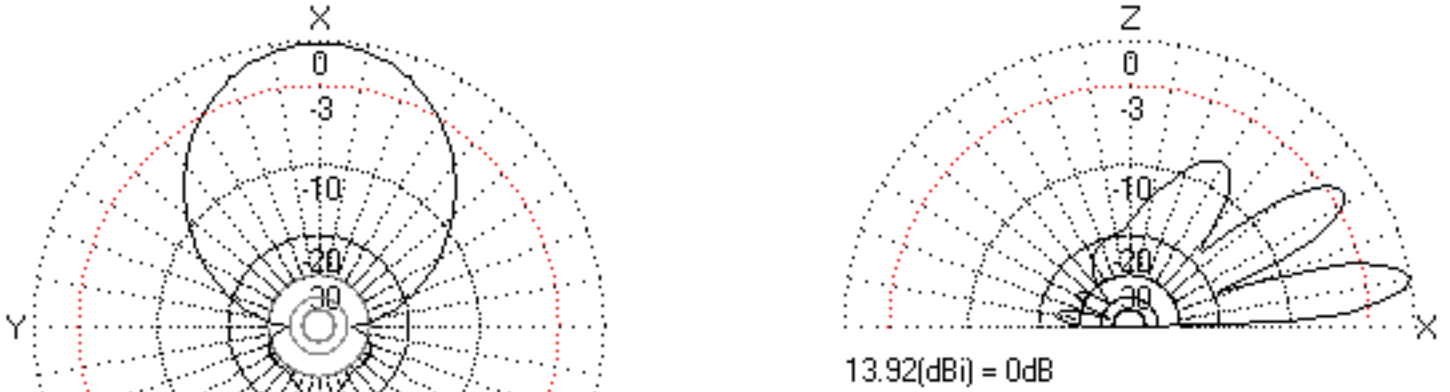
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0
12	28.9 - j0.19	1.73	13.89	22.68	10.5	28.0
13	29.3 - j0.45	1.71	13.86	21.74	10.9	27.0
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0
15	30.3 - j0.13	1.65	13.79	18.86	11.7	25.0
16	30.4 + j0.45	1.64	13.76	18.23	12.2	24.0



13.92(dBi) = 0dB

Order

Evolution value

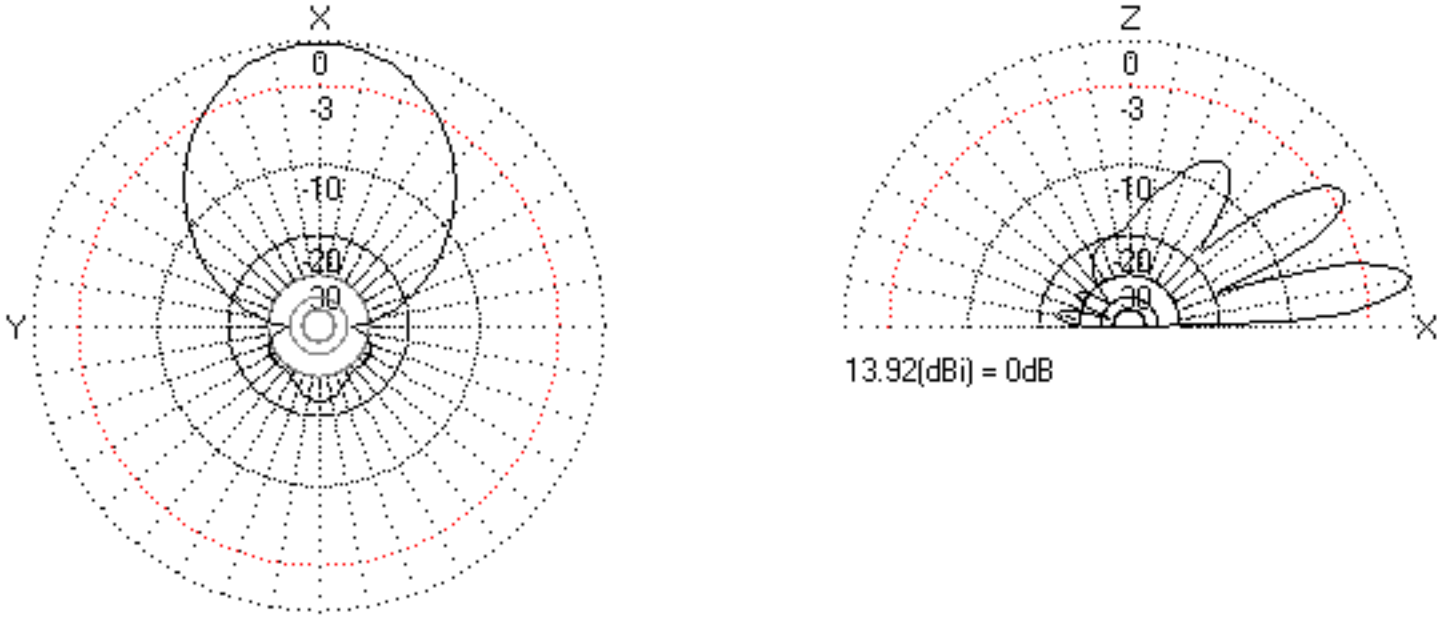
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0
12	28.9 - j0.19	1.73	13.89	22.68	10.5	28.0
13	29.3 - j0.45	1.71	13.86	21.74	10.9	27.0
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0
15	30.3 - j0.13	1.65	13.79	18.86	11.7	25.0
16	30.4 + j0.45	1.64	13.76	18.23	12.2	24.0



13.92(dBi) = 0dB

Order

Evolution value

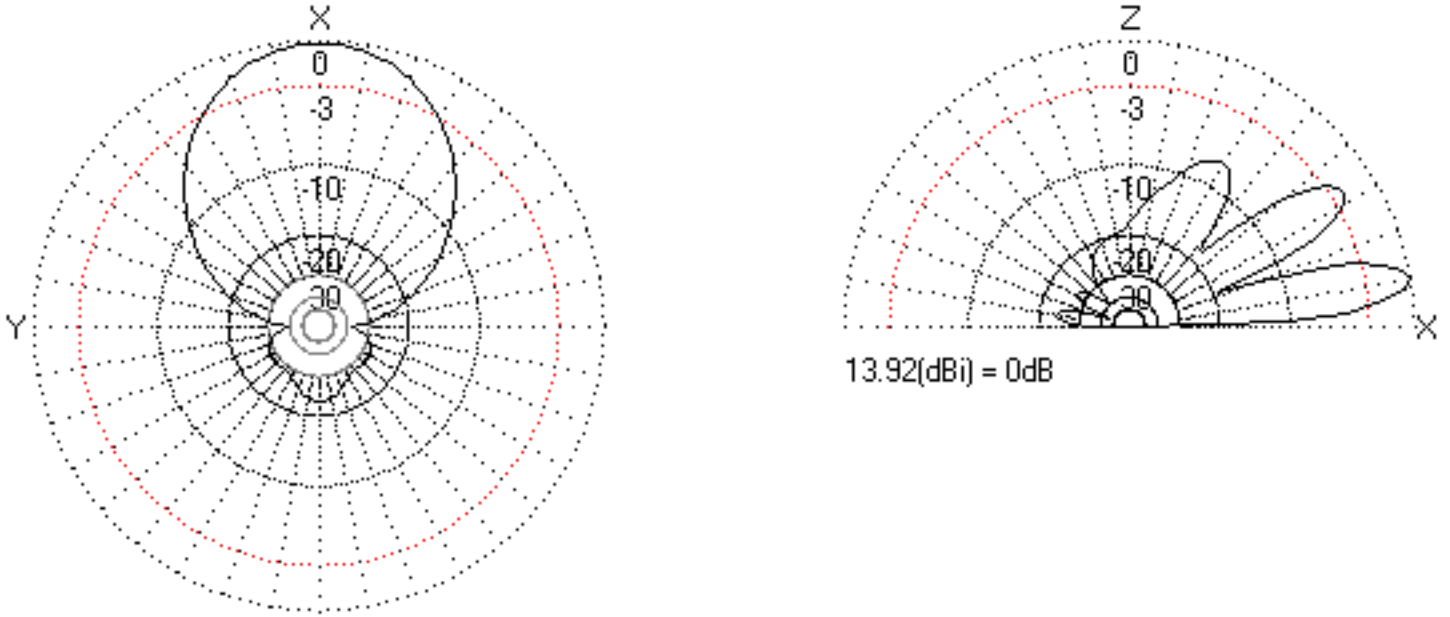
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0
12	28.9 - j0.19	1.73	13.89	22.68	10.5	28.0
13	29.3 - j0.45	1.71	13.86	21.74	10.9	27.0
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0
15	30.3 - j0.13	1.65	13.79	18.86	11.7	25.0
16	30.4 + j0.45	1.64	13.76	18.23	12.2	24.0



13.92(dBi) = 0dB

Order

Evolution value

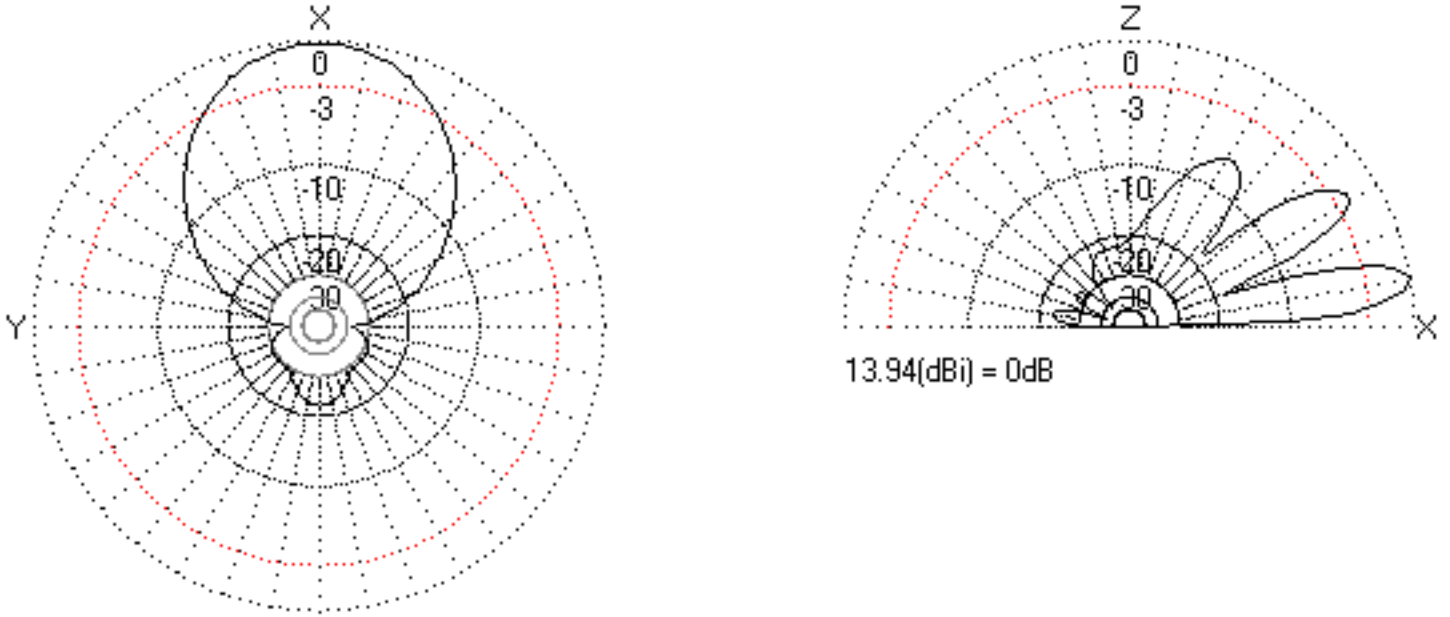
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
10	28.9 + j0.53	1.73	13.94	22.07	9.9	30.0
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0
12	28.9 - j0.19	1.73	13.89	22.68	10.5	28.0
13	29.3 - j0.45	1.71	13.86	21.74	10.9	27.0
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0
15	30.3 - j0.13	1.65	13.79	18.86	11.7	25.0



13.94(dBi) = 0dB

Order

Evolution value

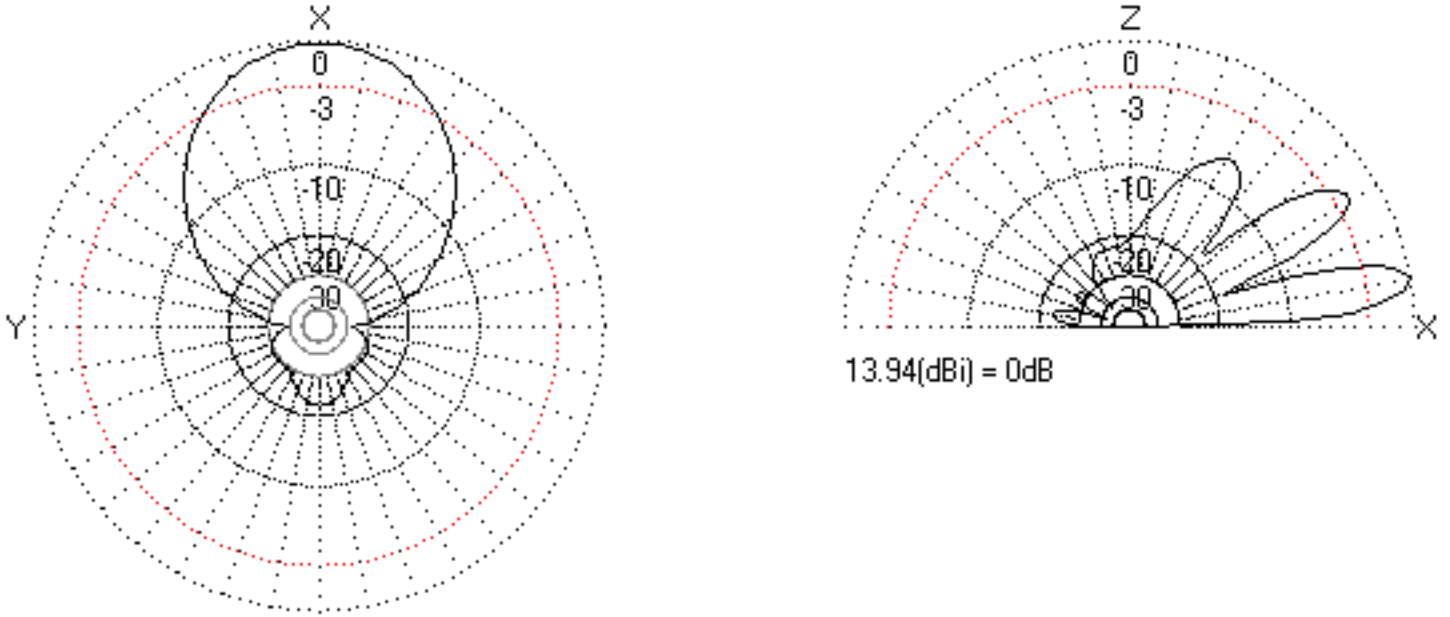
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
10	28.9 + j0.53	1.73	13.94	22.07	9.9	30.0
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0
12	28.9 - j0.19	1.73	13.89	22.68	10.5	28.0
13	29.3 - j0.45	1.71	13.86	21.74	10.9	27.0
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0
15	30.3 - j0.13	1.65	13.79	18.86	11.7	25.0



13.94(dBi) = 0dB

Order

Evolution value

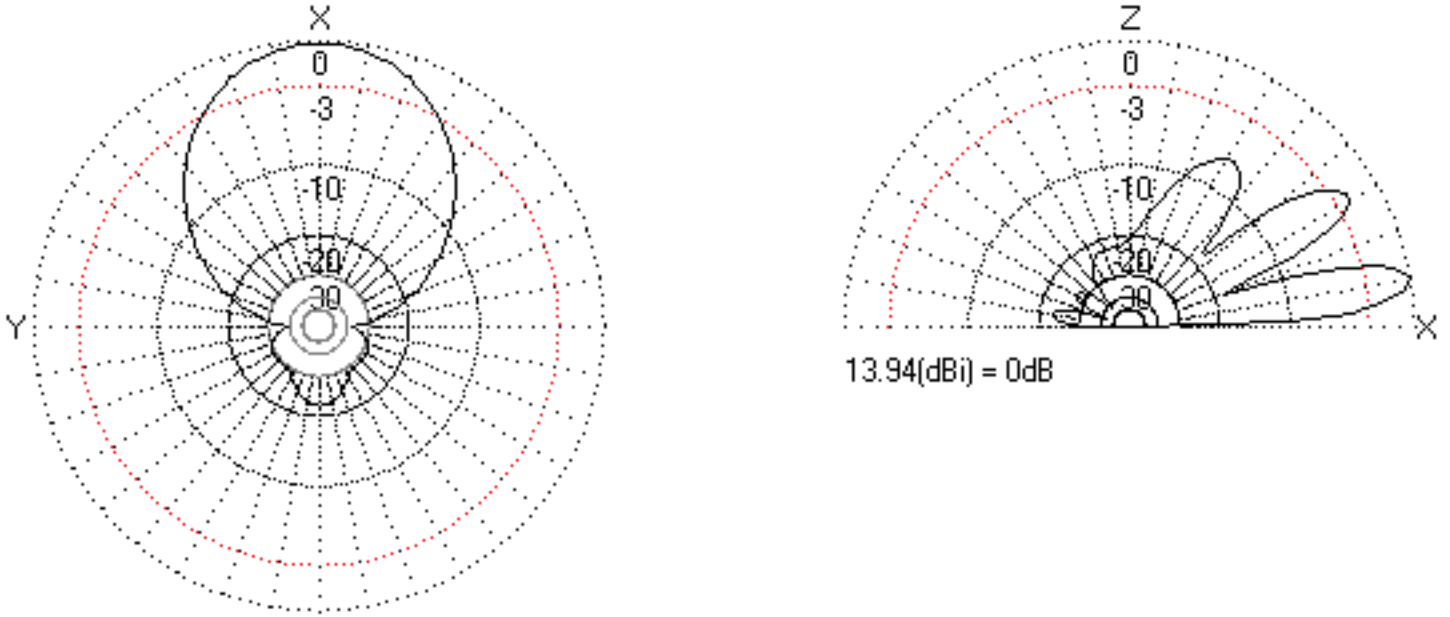
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
10	28.9 + j0.53	1.73	13.94	22.07	9.9	30.0
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0
12	28.9 - j0.19	1.73	13.89	22.68	10.5	28.0
13	29.3 - j0.45	1.71	13.86	21.74	10.9	27.0
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0
15	30.3 - j0.13	1.65	13.79	18.86	11.7	25.0



13.94(dBi) = 0dB

Order

Evolution value

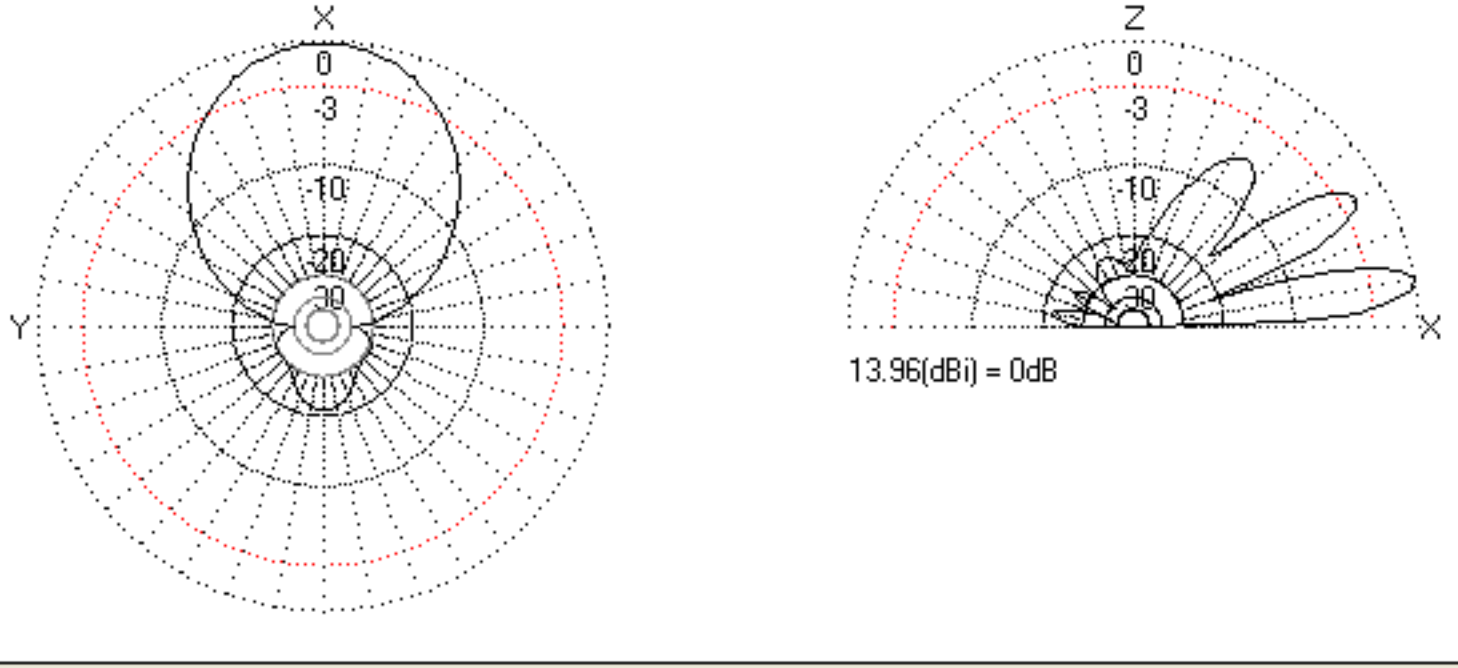
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
9	29.1 + j0.8	1.72	13.96	21.05	9.6	31.0
10	28.9 + j0.53	1.73	13.94	22.07	9.9	30.0
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0
12	28.9 - j0.19	1.73	13.89	22.68	10.5	28.0
13	29.3 - j0.45	1.71	13.86	21.74	10.9	27.0
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0



Order

Evolution value

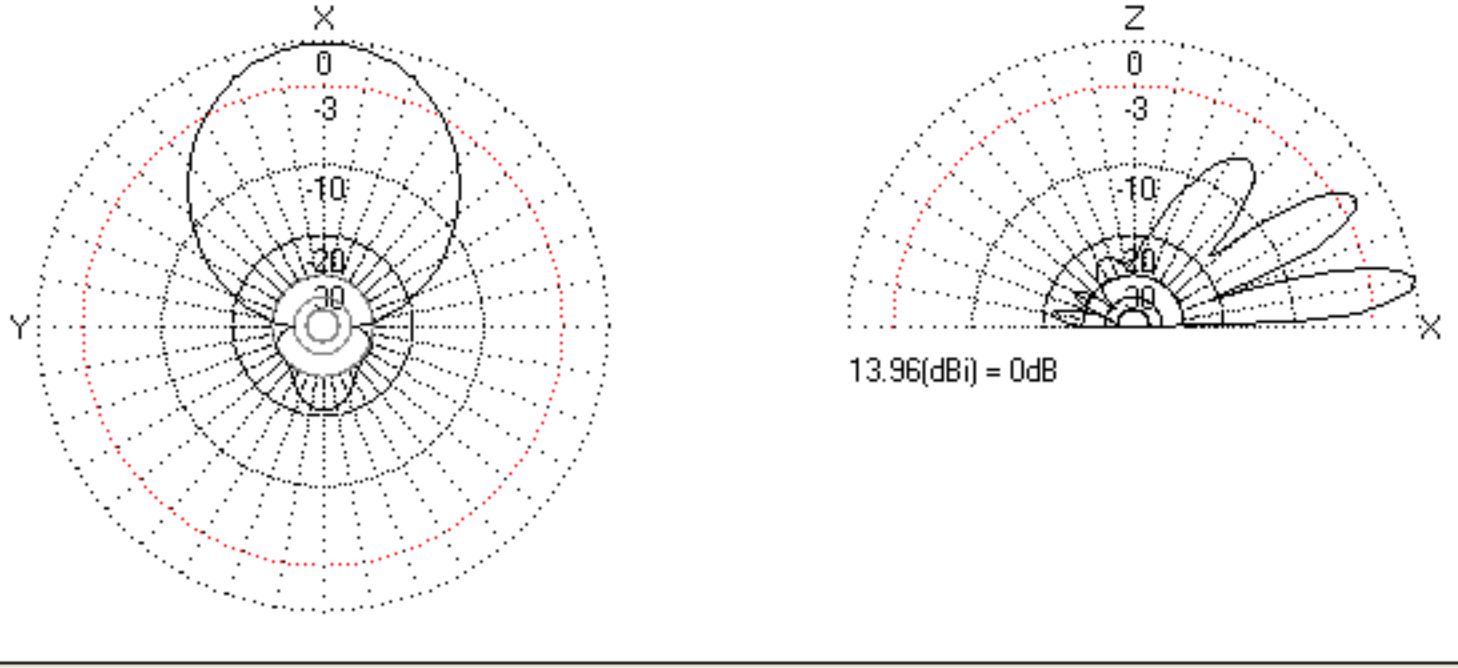
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
9	29.1 + j0.8	1.72	13.96	21.05	9.6	31.0
10	28.9 + j0.53	1.73	13.94	22.07	9.9	30.0
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0
12	28.9 - j0.19	1.73	13.89	22.68	10.5	28.0
13	29.3 - j0.45	1.71	13.86	21.74	10.9	27.0
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0



Order

Evolution value

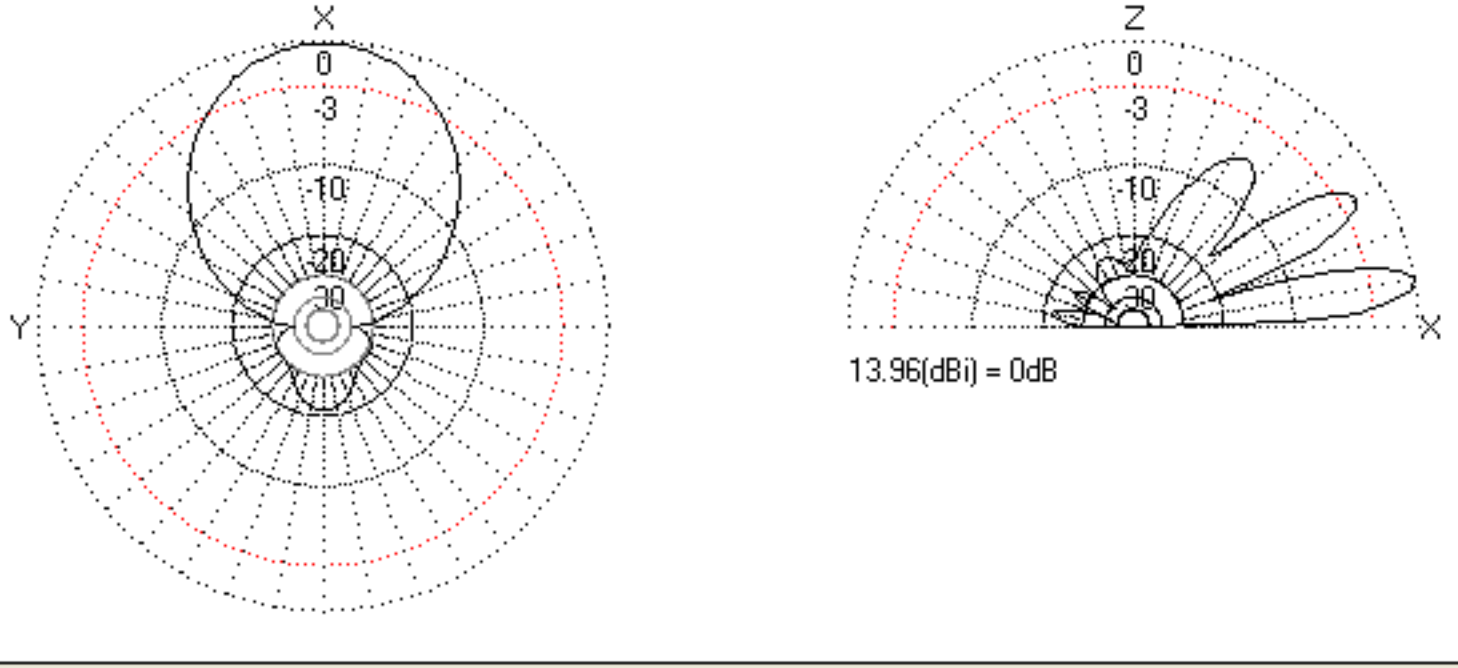
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
9	29.1 + j0.8	1.72	13.96	21.05	9.6	31.0
10	28.9 + j0.53	1.73	13.94	22.07	9.9	30.0
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0
12	28.9 - j0.19	1.73	13.89	22.68	10.5	28.0
13	29.3 - j0.45	1.71	13.86	21.74	10.9	27.0
14	29.8 - j0.47	1.68	13.82	20.18	11.3	26.0



Order

Evolution value

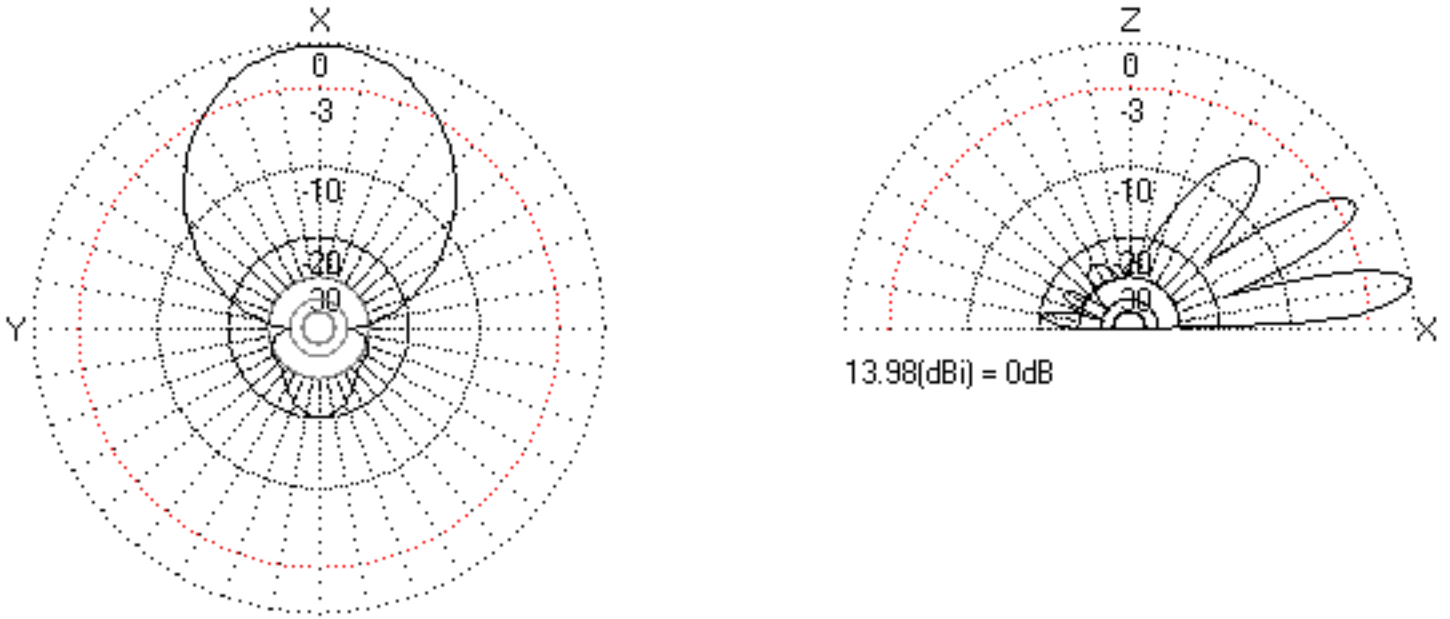
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
8	29.4 + j0.94	1.7	13.98	20.06	9.3	32.0
9	29.1 + j0.8	1.72	13.96	21.05	9.6	31.0
10	28.9 + j0.53	1.73	13.94	22.07	9.9	30.0
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0
12	28.9 - j0.19	1.73	13.89	22.68	10.5	28.0
13	29.3 - j0.45	1.71	13.86	21.74	10.9	27.0



13.98(dBi) = 0dB

Order

Evolution value

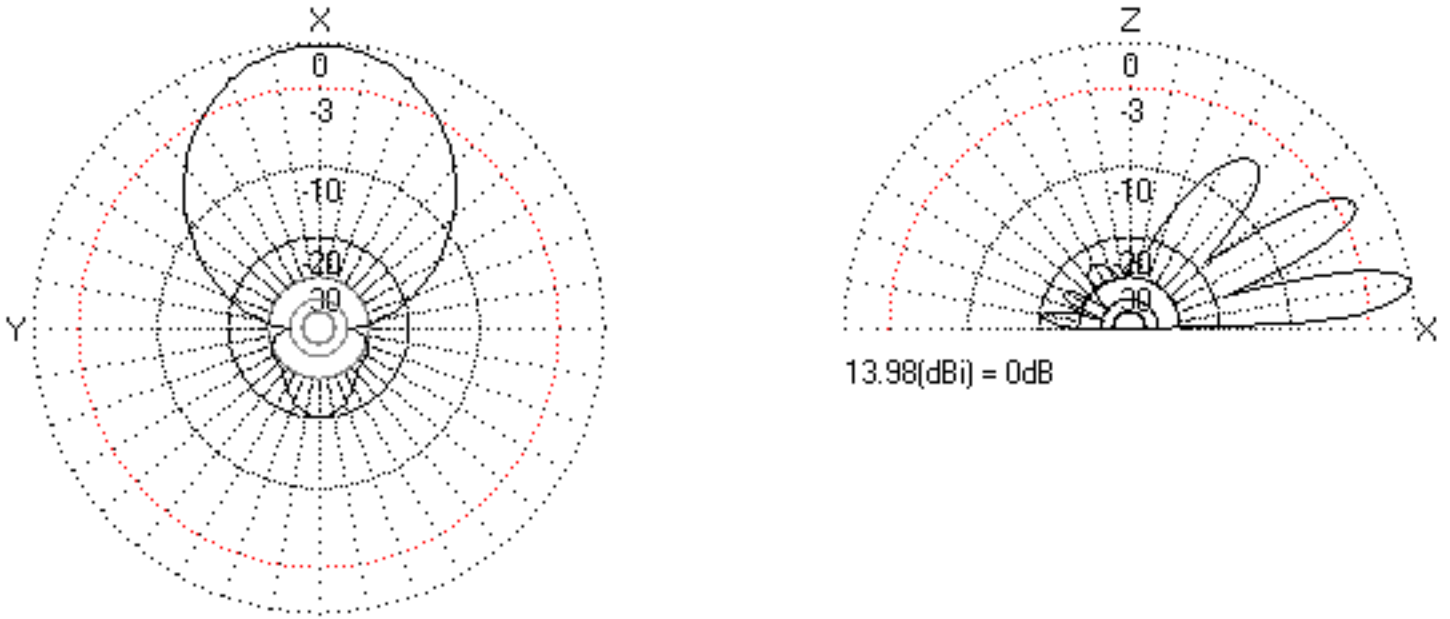
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
8	29.4 + j0.94	1.7	13.98	20.06	9.3	32.0
9	29.1 + j0.8	1.72	13.96	21.05	9.6	31.0
10	28.9 + j0.53	1.73	13.94	22.07	9.9	30.0
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0
12	28.9 - j0.19	1.73	13.89	22.68	10.5	28.0
13	29.3 - j0.45	1.71	13.86	21.74	10.9	27.0



13.98(dBi) = 0dB

Order

Evolution value

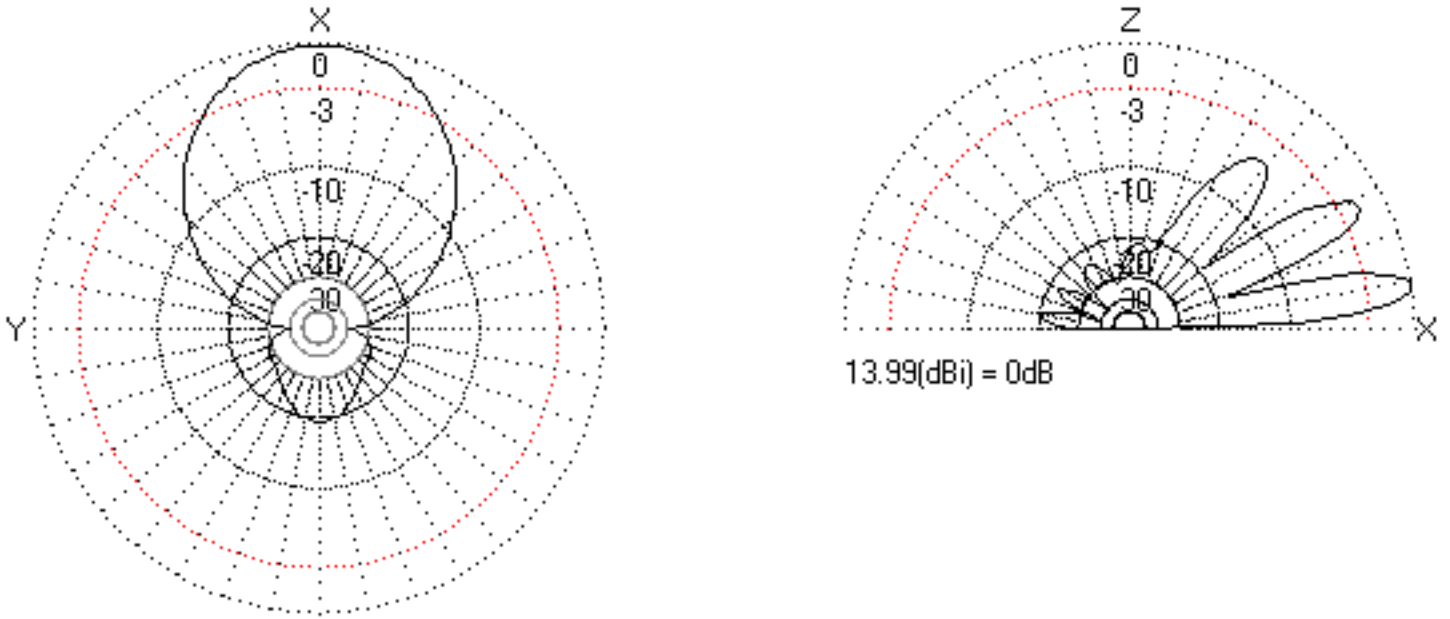
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0
8	29.4 + j0.94	1.7	13.98	20.06	9.3	32.0
9	29.1 + j0.8	1.72	13.96	21.05	9.6	31.0
10	28.9 + j0.53	1.73	13.94	22.07	9.9	30.0
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0
12	28.9 - j0.19	1.73	13.89	22.68	10.5	28.0



Order

Evolution value

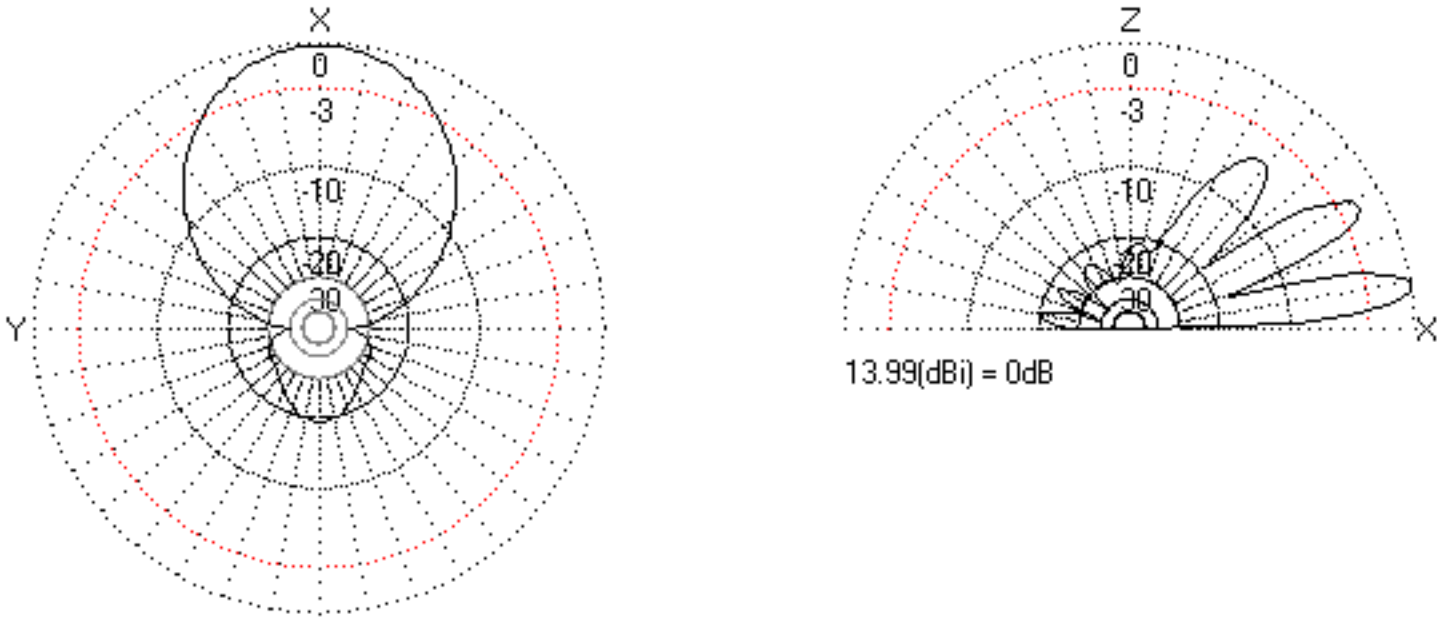
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0
8	29.4 + j0.94	1.7	13.98	20.06	9.3	32.0
9	29.1 + j0.8	1.72	13.96	21.05	9.6	31.0
10	28.9 + j0.53	1.73	13.94	22.07	9.9	30.0
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0
12	28.9 - j0.19	1.73	13.89	22.68	10.5	28.0



Order

Evolution value

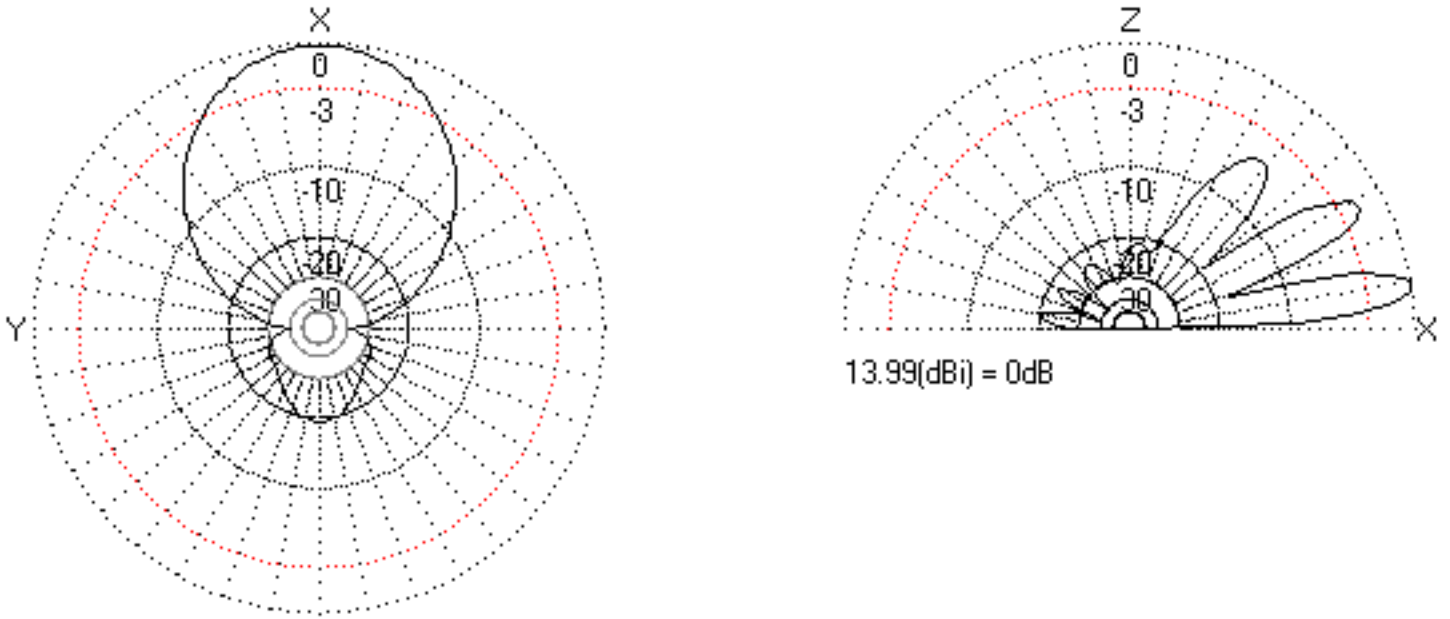
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0
8	29.4 + j0.94	1.7	13.98	20.06	9.3	32.0
9	29.1 + j0.8	1.72	13.96	21.05	9.6	31.0
10	28.9 + j0.53	1.73	13.94	22.07	9.9	30.0
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0
12	28.9 - j0.19	1.73	13.89	22.68	10.5	28.0



Order

Evolution value

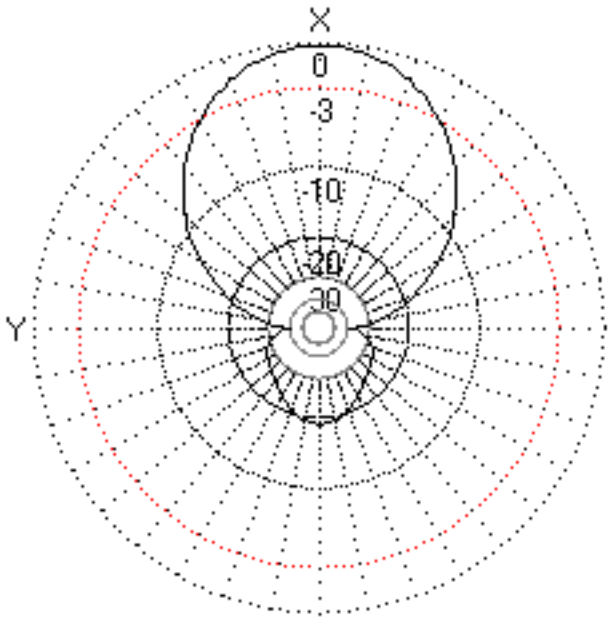
OK

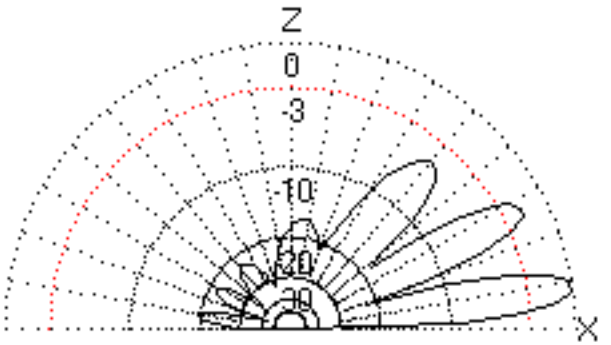
Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
6	30.0 + j0.68	1.67	13.99	18.81	8.7	34.0
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0
8	29.4 + j0.94	1.7	13.98	20.06	9.3	32.0
9	29.1 + j0.8	1.72	13.96	21.05	9.6	31.0
10	28.9 + j0.53	1.73	13.94	22.07	9.9	30.0
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0





13.99(dBi) = 0dB

Order

Evolution value

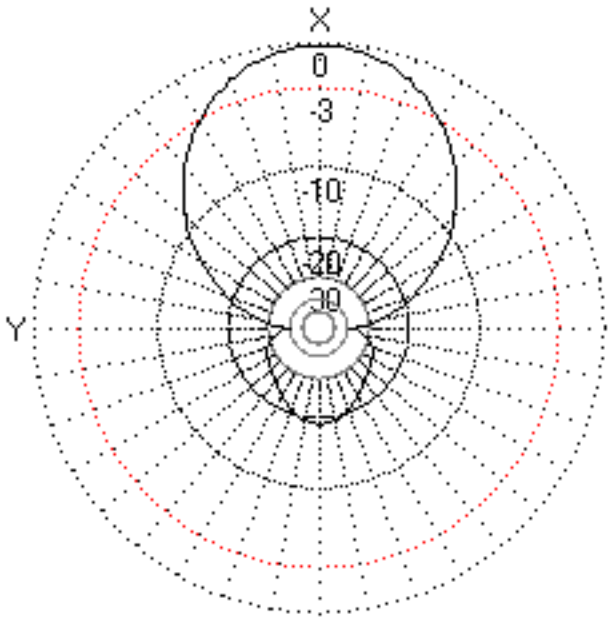
OK

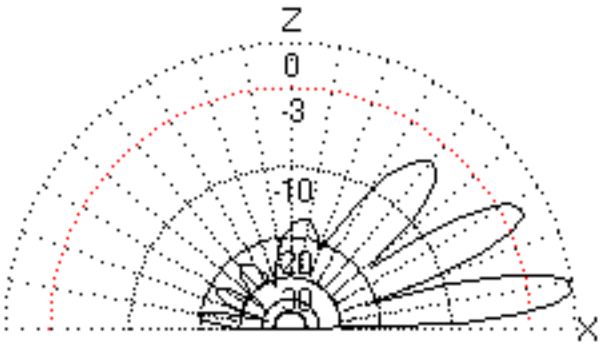
Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
6	30.0 + j0.68	1.67	13.99	18.81	8.7	34.0
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0
8	29.4 + j0.94	1.7	13.98	20.06	9.3	32.0
9	29.1 + j0.8	1.72	13.96	21.05	9.6	31.0
10	28.9 + j0.53	1.73	13.94	22.07	9.9	30.0
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0





13.99(dBi) = 0dB

Order

Evolution value

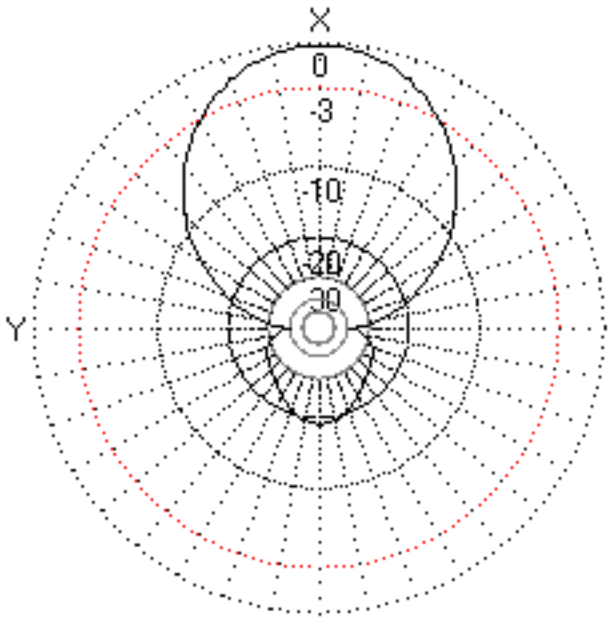
OK

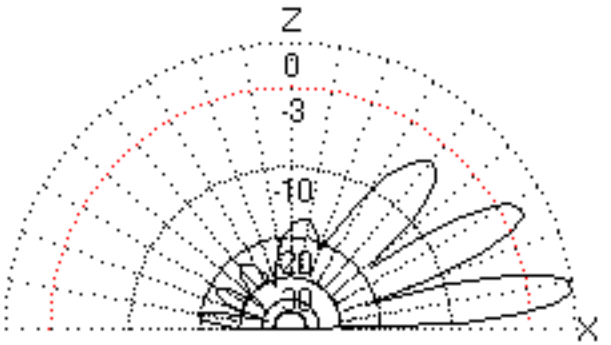
Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
6	30.0 + j0.68	1.67	13.99	18.81	8.7	34.0
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0
8	29.4 + j0.94	1.7	13.98	20.06	9.3	32.0
9	29.1 + j0.8	1.72	13.96	21.05	9.6	31.0
10	28.9 + j0.53	1.73	13.94	22.07	9.9	30.0
11	28.8 + j0.17	1.74	13.92	22.56	10.2	29.0





13.99(dBi) = 0dB

Order

Evolution value

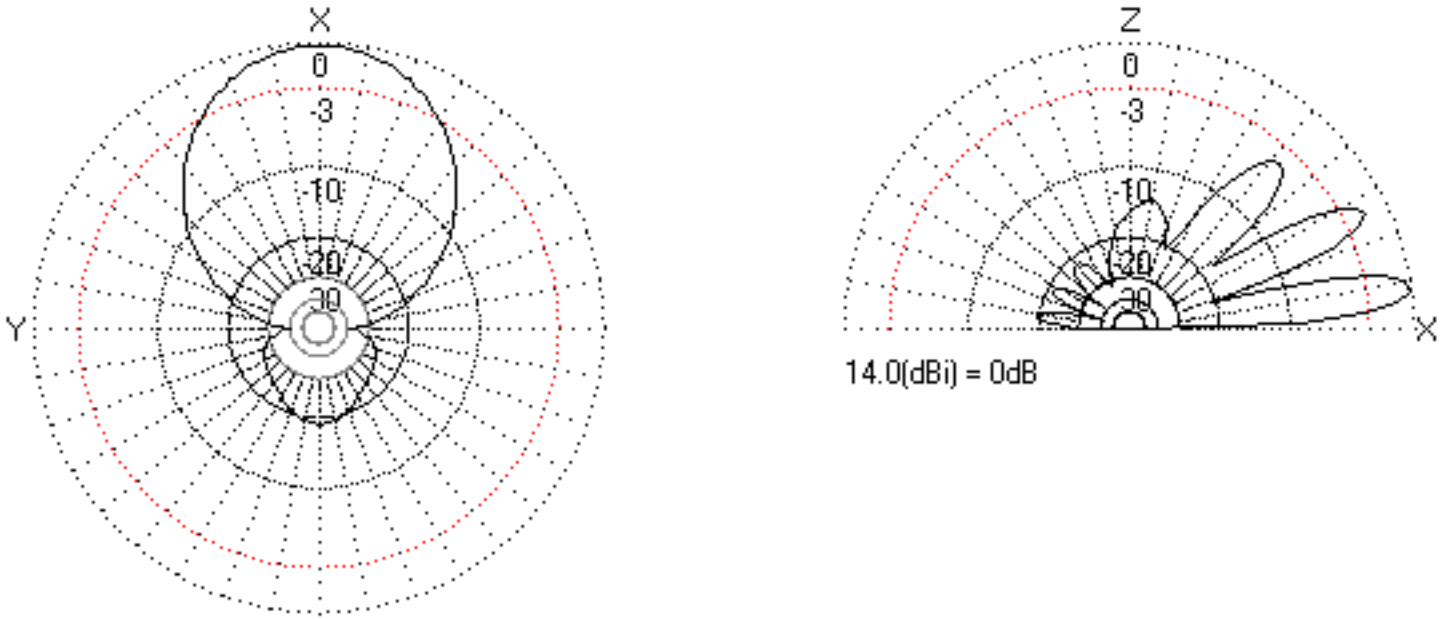
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
5	30.1 + j0.31	1.66	14.0	18.88	8.5	35.0
6	30.0 + j0.68	1.67	13.99	18.81	8.7	34.0
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0
8	29.4 + j0.94	1.7	13.98	20.06	9.3	32.0
9	29.1 + j0.8	1.72	13.96	21.05	9.6	31.0
10	28.9 + j0.53	1.73	13.94	22.07	9.9	30.0



Order

Evolution value

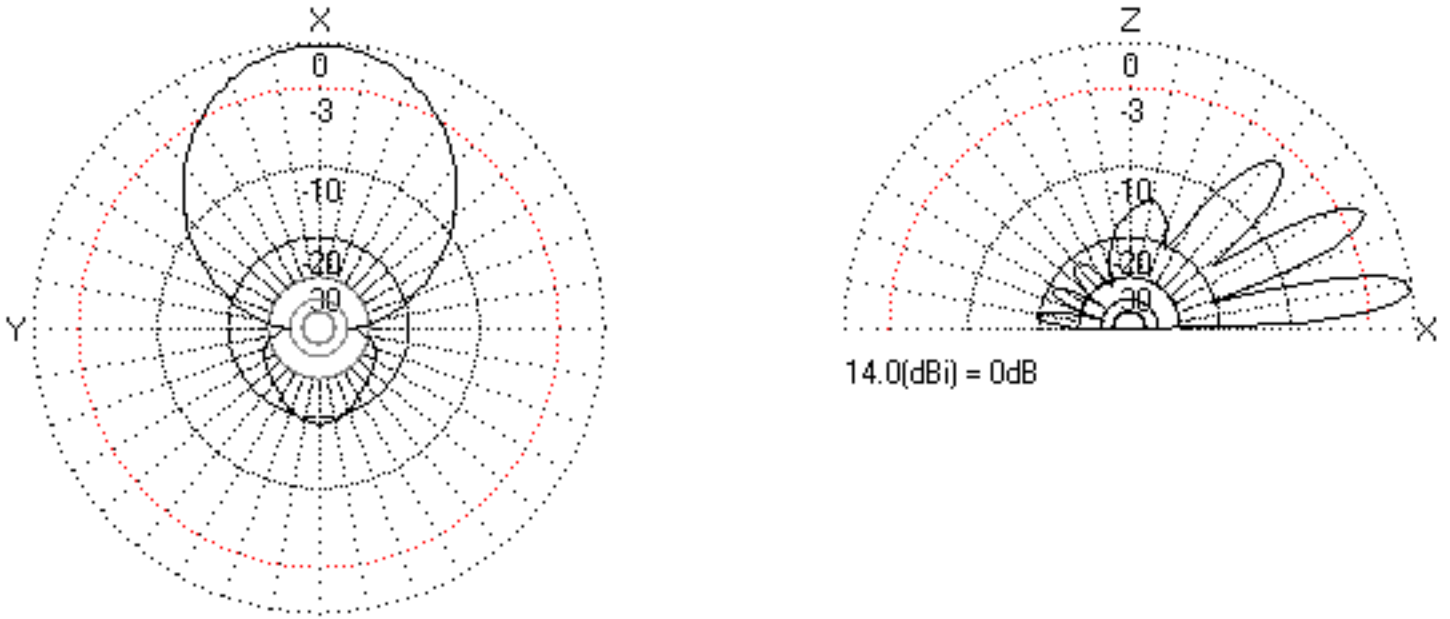
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
5	30.1 + j0.31	1.66	14.0	18.88	8.5	35.0
6	30.0 + j0.68	1.67	13.99	18.81	8.7	34.0
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0
8	29.4 + j0.94	1.7	13.98	20.06	9.3	32.0
9	29.1 + j0.8	1.72	13.96	21.05	9.6	31.0
10	28.9 + j0.53	1.73	13.94	22.07	9.9	30.0



Order

Evolution value

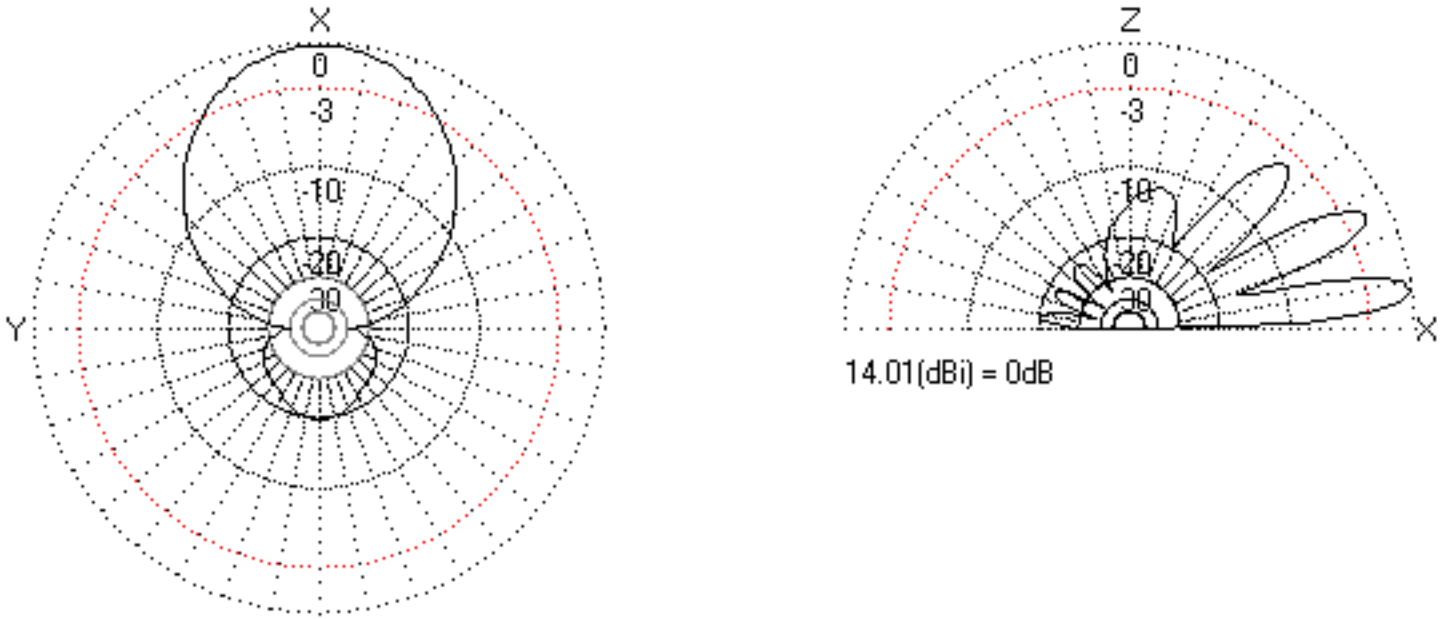
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
4	29.9 - j0.06	1.67	14.01	19.51	8.3	36.0
5	30.1 + j0.31	1.66	14.0	18.88	8.5	35.0
6	30.0 + j0.68	1.67	13.99	18.81	8.7	34.0
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0
8	29.4 + j0.94	1.7	13.98	20.06	9.3	32.0
9	29.1 + j0.8	1.72	13.96	21.05	9.6	31.0



14.01(dBi) = 0dB

Order

Evolution value

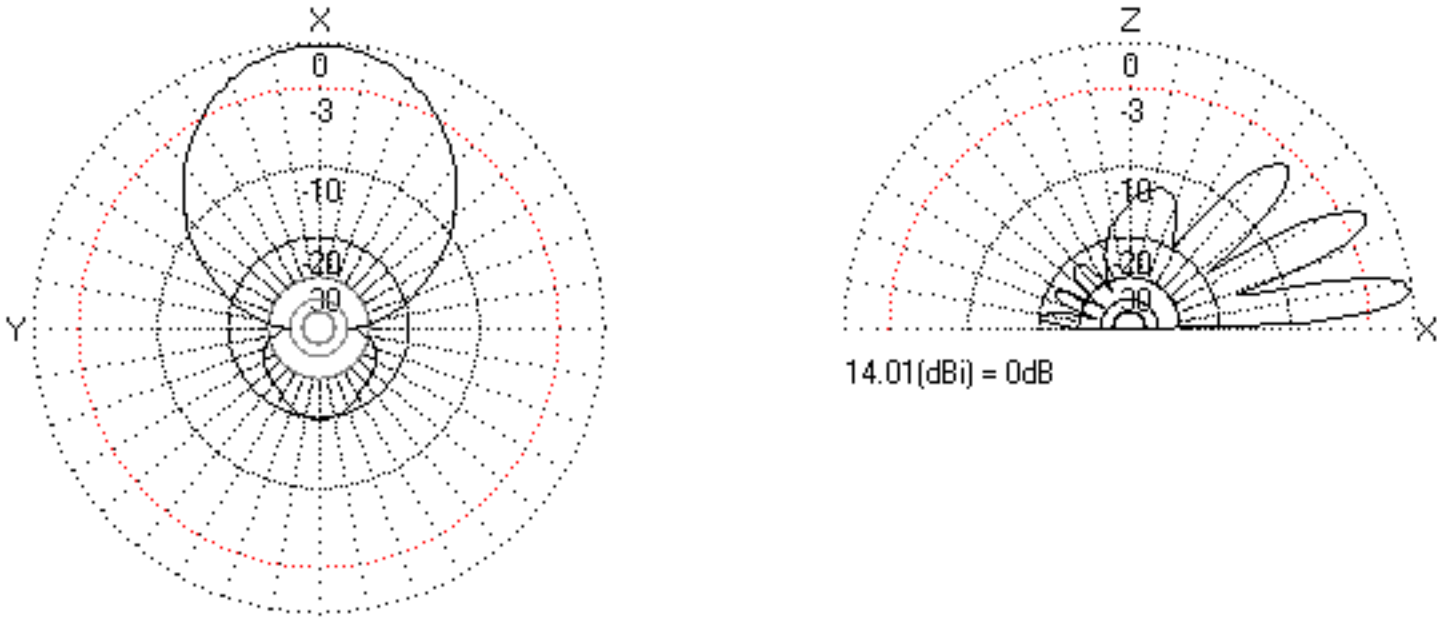
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
4	29.9 - j0.06	1.67	14.01	19.51	8.3	36.0
5	30.1 + j0.31	1.66	14.0	18.88	8.5	35.0
6	30.0 + j0.68	1.67	13.99	18.81	8.7	34.0
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0
8	29.4 + j0.94	1.7	13.98	20.06	9.3	32.0
9	29.1 + j0.8	1.72	13.96	21.05	9.6	31.0



14.01(dBi) = 0dB

Order

Evolution value

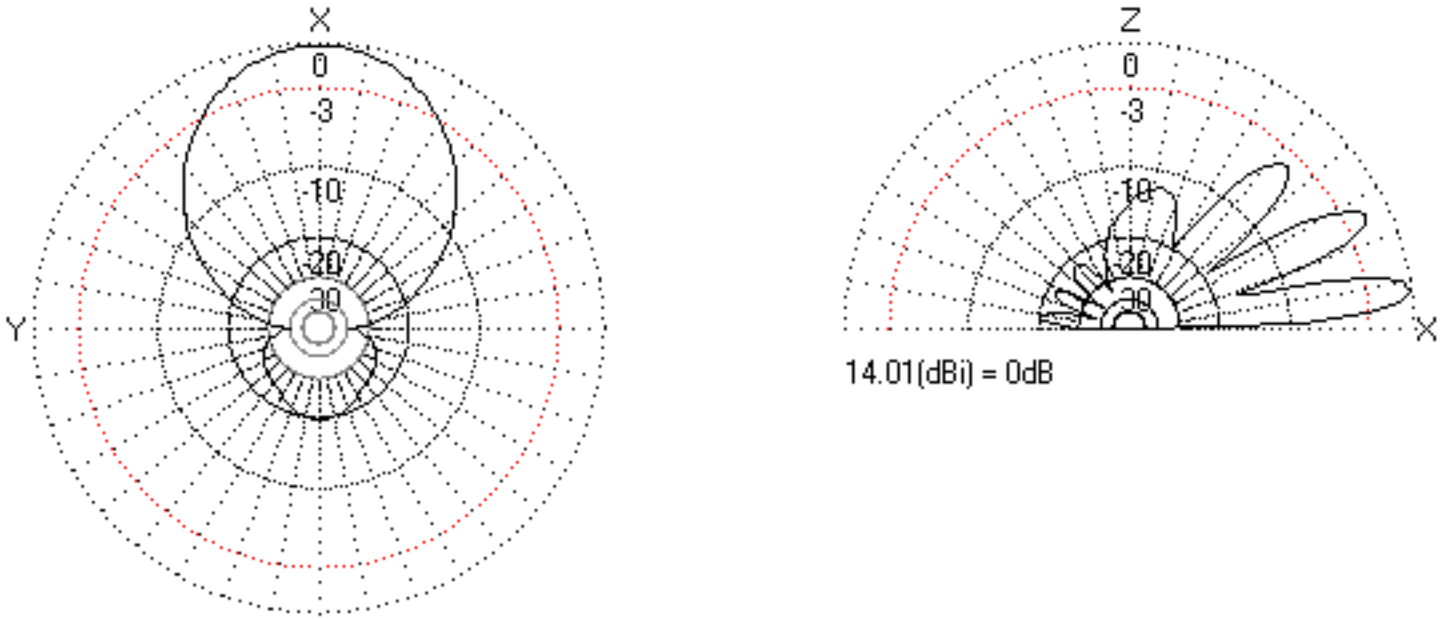
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
4	29.9 - j0.06	1.67	14.01	19.51	8.3	36.0
5	30.1 + j0.31	1.66	14.0	18.88	8.5	35.0
6	30.0 + j0.68	1.67	13.99	18.81	8.7	34.0
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0
8	29.4 + j0.94	1.7	13.98	20.06	9.3	32.0
9	29.1 + j0.8	1.72	13.96	21.05	9.6	31.0



14.01(dBi) = 0dB

Order

Evolution value

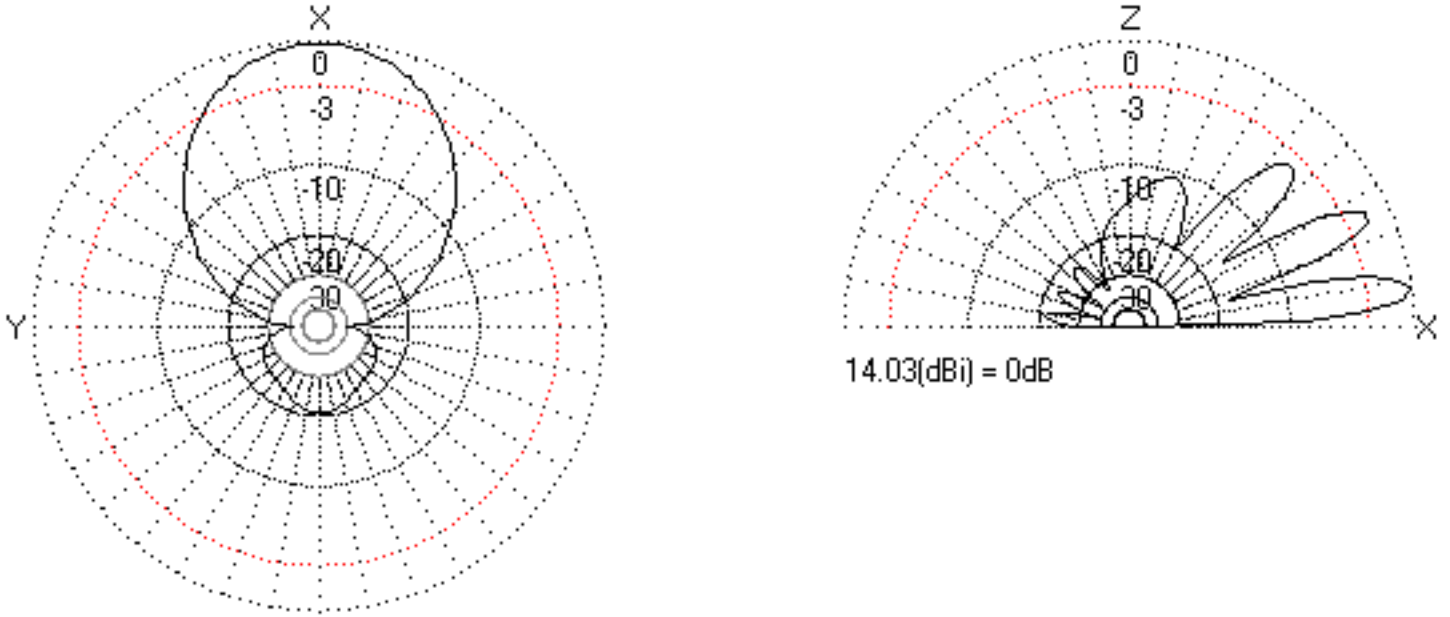
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
3	29.6 - j0.23	1.69	14.03	20.53	8.1	37.0
4	29.9 - j0.06	1.67	14.01	19.51	8.3	36.0
5	30.1 + j0.31	1.66	14.0	18.88	8.5	35.0
6	30.0 + j0.68	1.67	13.99	18.81	8.7	34.0
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0
8	29.4 + j0.94	1.7	13.98	20.06	9.3	32.0



Order

Evolution value

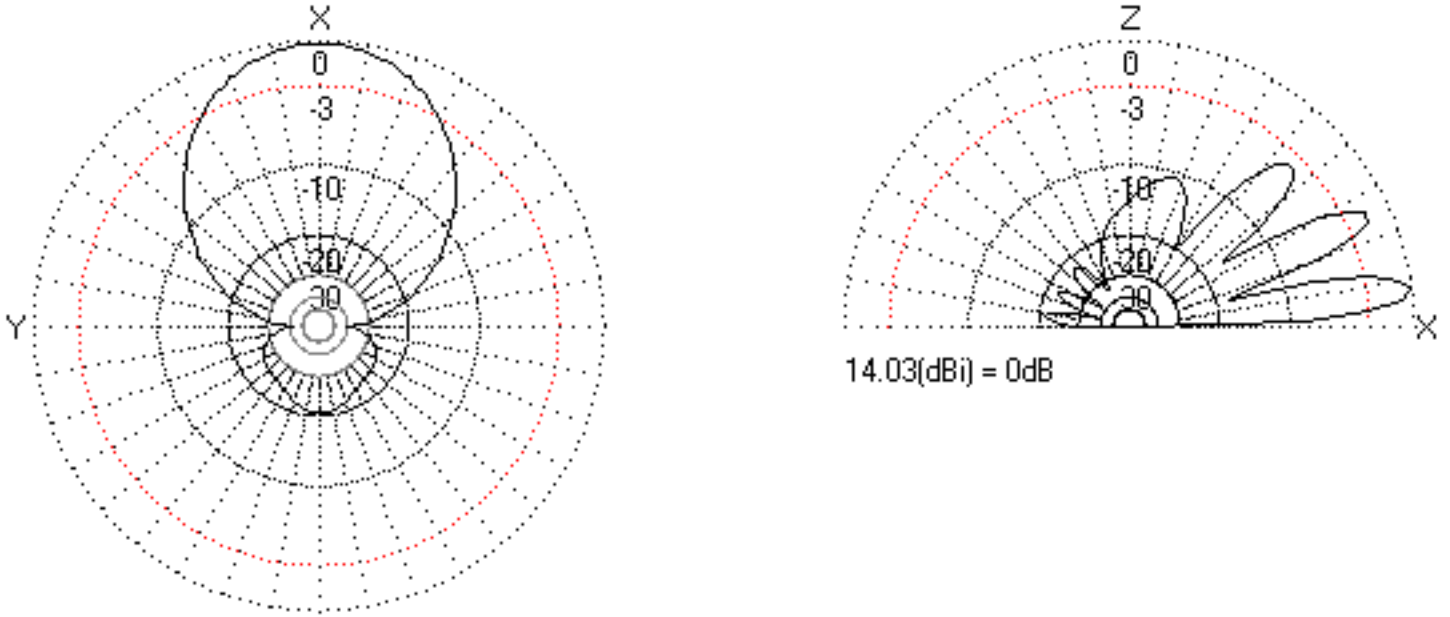
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
3	29.6 - j0.23	1.69	14.03	20.53	8.1	37.0
4	29.9 - j0.06	1.67	14.01	19.51	8.3	36.0
5	30.1 + j0.31	1.66	14.0	18.88	8.5	35.0
6	30.0 + j0.68	1.67	13.99	18.81	8.7	34.0
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0
8	29.4 + j0.94	1.7	13.98	20.06	9.3	32.0



Order

Evolution value

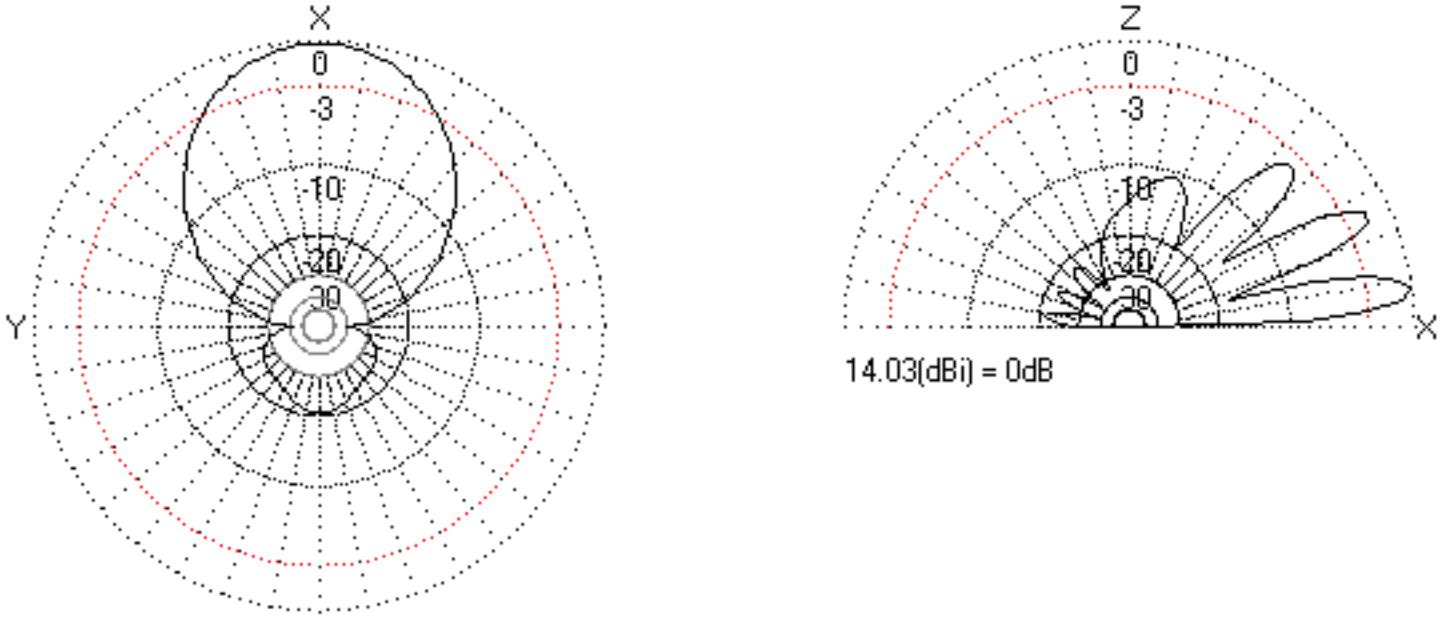
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
3	29.6 - j0.23	1.69	14.03	20.53	8.1	37.0
4	29.9 - j0.06	1.67	14.01	19.51	8.3	36.0
5	30.1 + j0.31	1.66	14.0	18.88	8.5	35.0
6	30.0 + j0.68	1.67	13.99	18.81	8.7	34.0
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0
8	29.4 + j0.94	1.7	13.98	20.06	9.3	32.0



Order

Evolution value

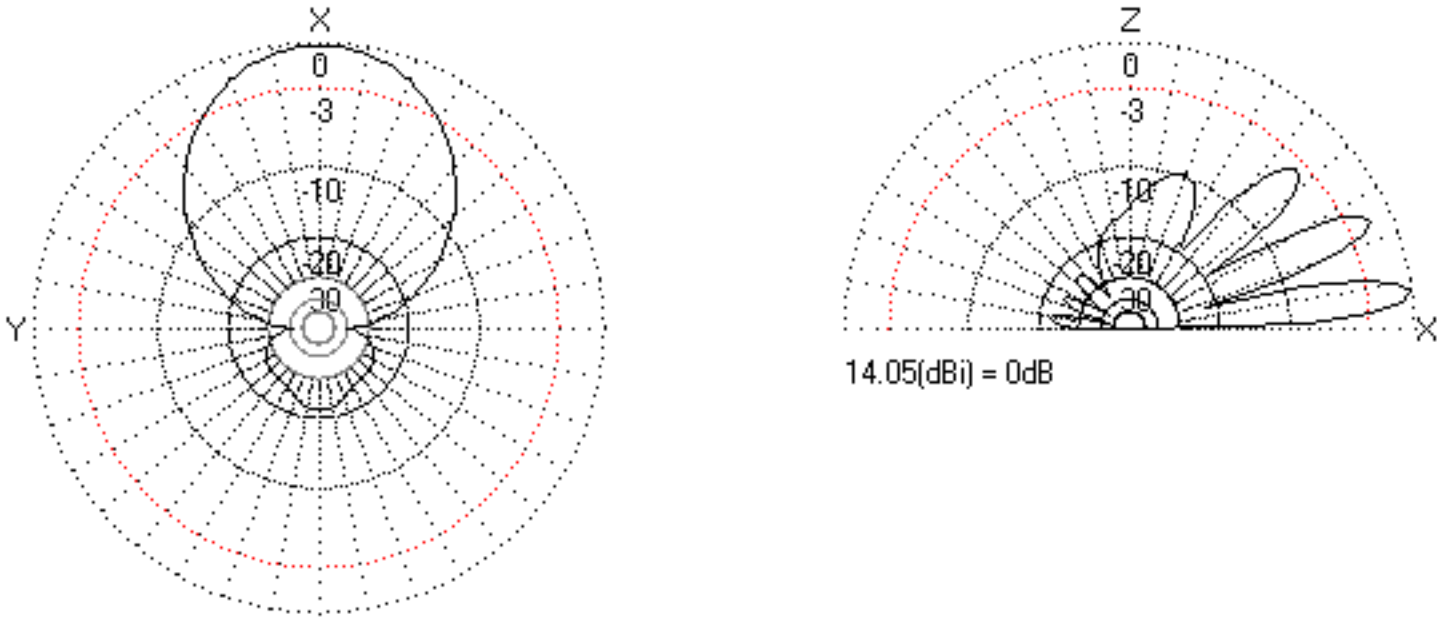
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
2	29.3 - j0.19	1.71	14.05	21.57	7.8	38.0
3	29.6 - j0.23	1.69	14.03	20.53	8.1	37.0
4	29.9 - j0.06	1.67	14.01	19.51	8.3	36.0
5	30.1 + j0.31	1.66	14.0	18.88	8.5	35.0
6	30.0 + j0.68	1.67	13.99	18.81	8.7	34.0
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0



14.05(dBi) = 0dB

Order

Evolution value

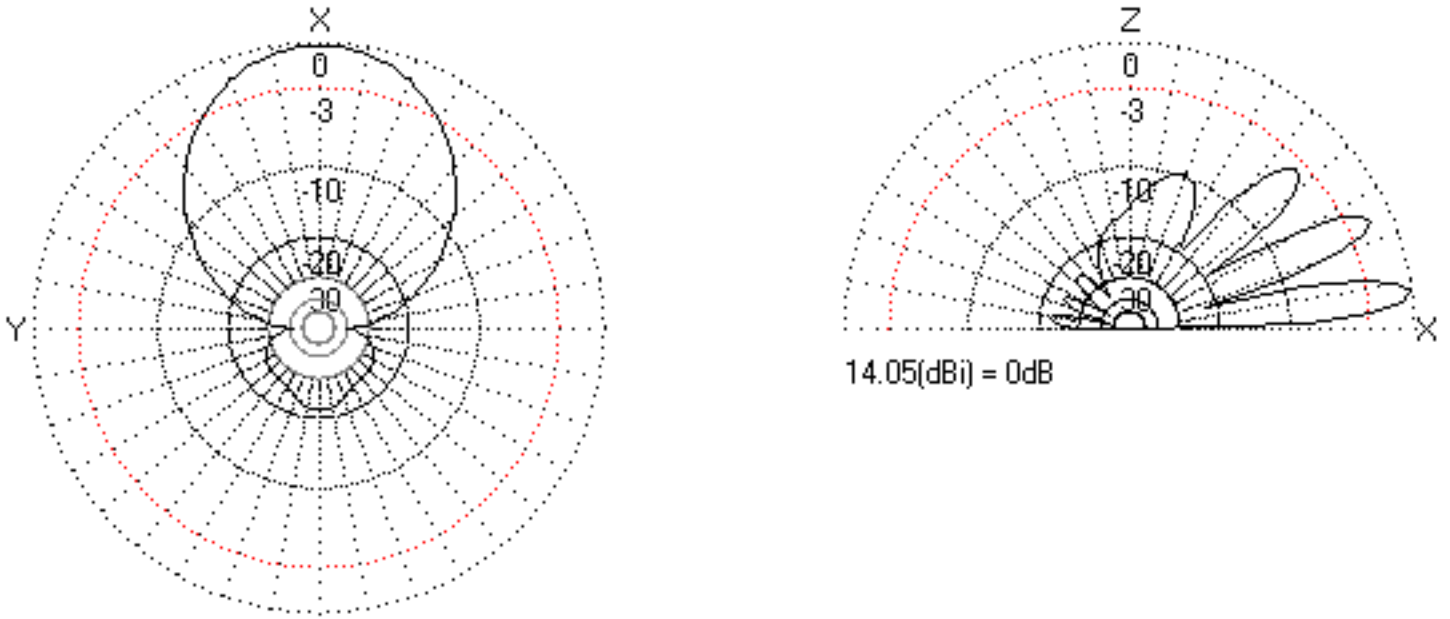
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
2	29.3 - j0.19	1.71	14.05	21.57	7.8	38.0
3	29.6 - j0.23	1.69	14.03	20.53	8.1	37.0
4	29.9 - j0.06	1.67	14.01	19.51	8.3	36.0
5	30.1 + j0.31	1.66	14.0	18.88	8.5	35.0
6	30.0 + j0.68	1.67	13.99	18.81	8.7	34.0
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0



14.05(dBi) = 0dB

Order

Evolution value

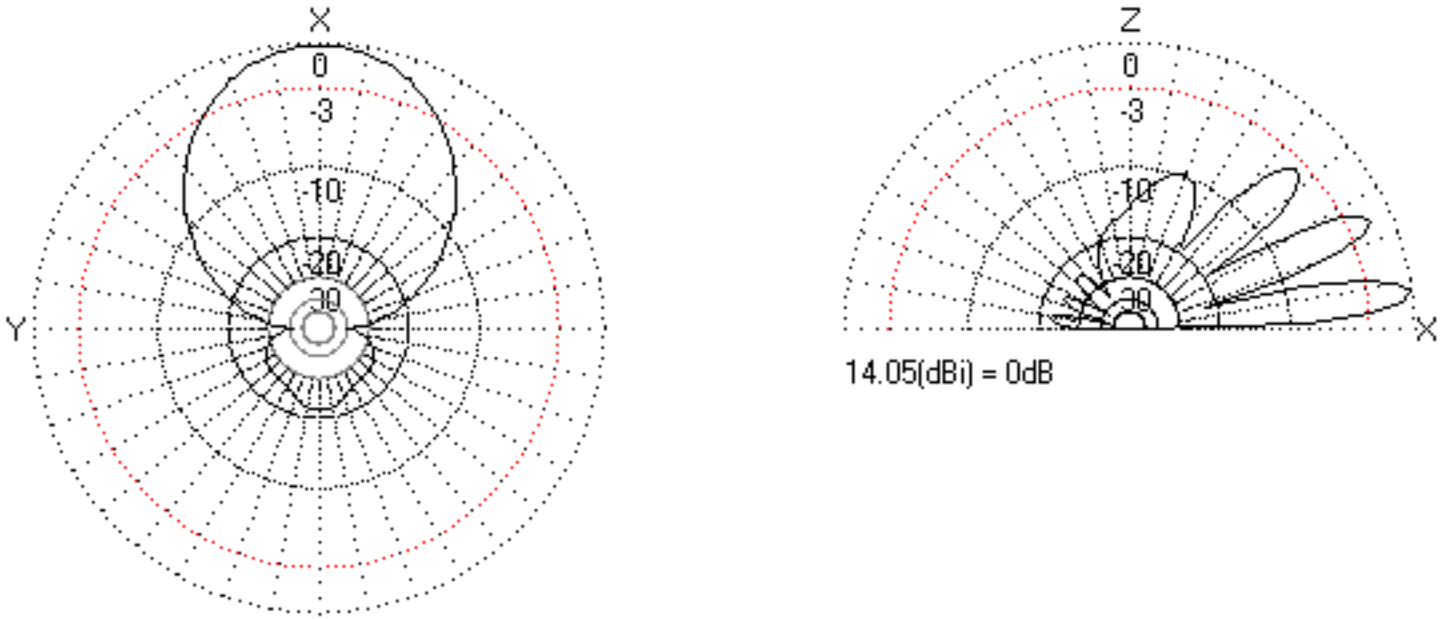
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
2	29.3 - j0.19	1.71	14.05	21.57	7.8	38.0
3	29.6 - j0.23	1.69	14.03	20.53	8.1	37.0
4	29.9 - j0.06	1.67	14.01	19.51	8.3	36.0
5	30.1 + j0.31	1.66	14.0	18.88	8.5	35.0
6	30.0 + j0.68	1.67	13.99	18.81	8.7	34.0
7	29.7 + j0.92	1.68	13.99	19.26	9.0	33.0



14.05(dBi) = 0dB

Order

Evolution value

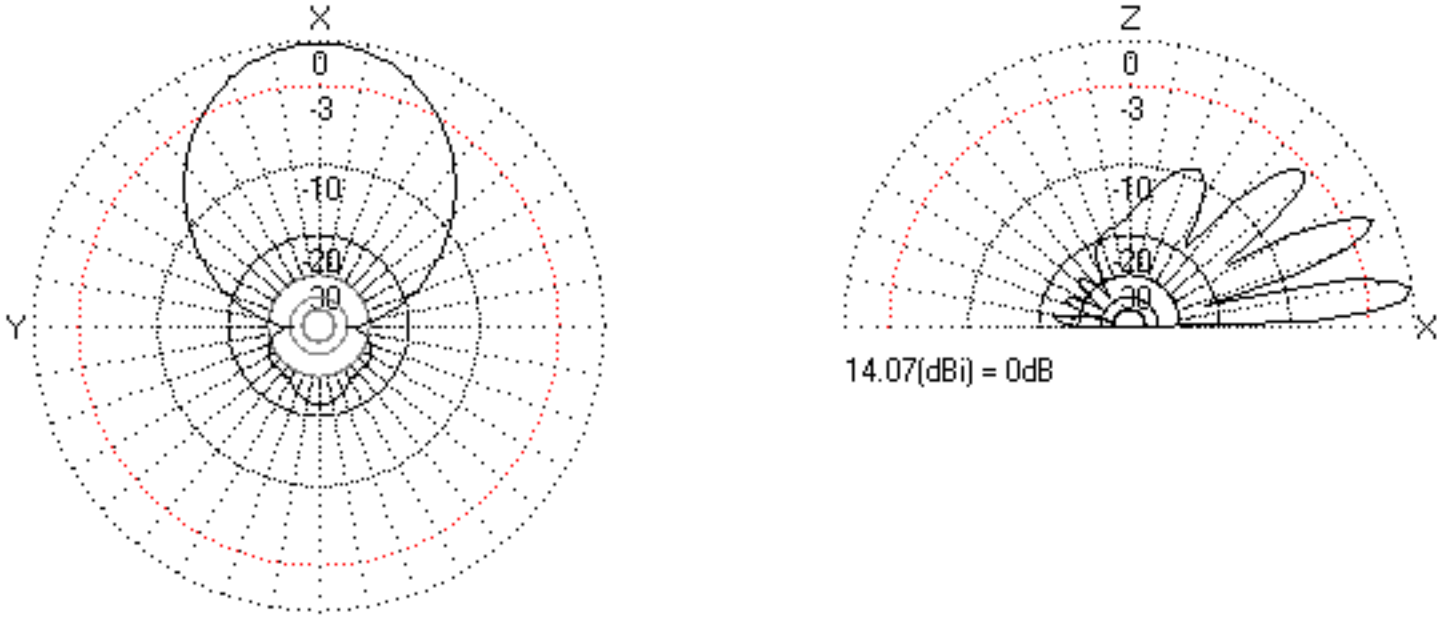
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
1	29.1 + j0.02	1.72	14.07	22.17	7.7	39.0
2	29.3 - j0.19	1.71	14.05	21.57	7.8	38.0
3	29.6 - j0.23	1.69	14.03	20.53	8.1	37.0
4	29.9 - j0.06	1.67	14.01	19.51	8.3	36.0
5	30.1 + j0.31	1.66	14.0	18.88	8.5	35.0
6	30.0 + j0.68	1.67	13.99	18.81	8.7	34.0



14.07(dBi) = 0dB

Order

Evolution value

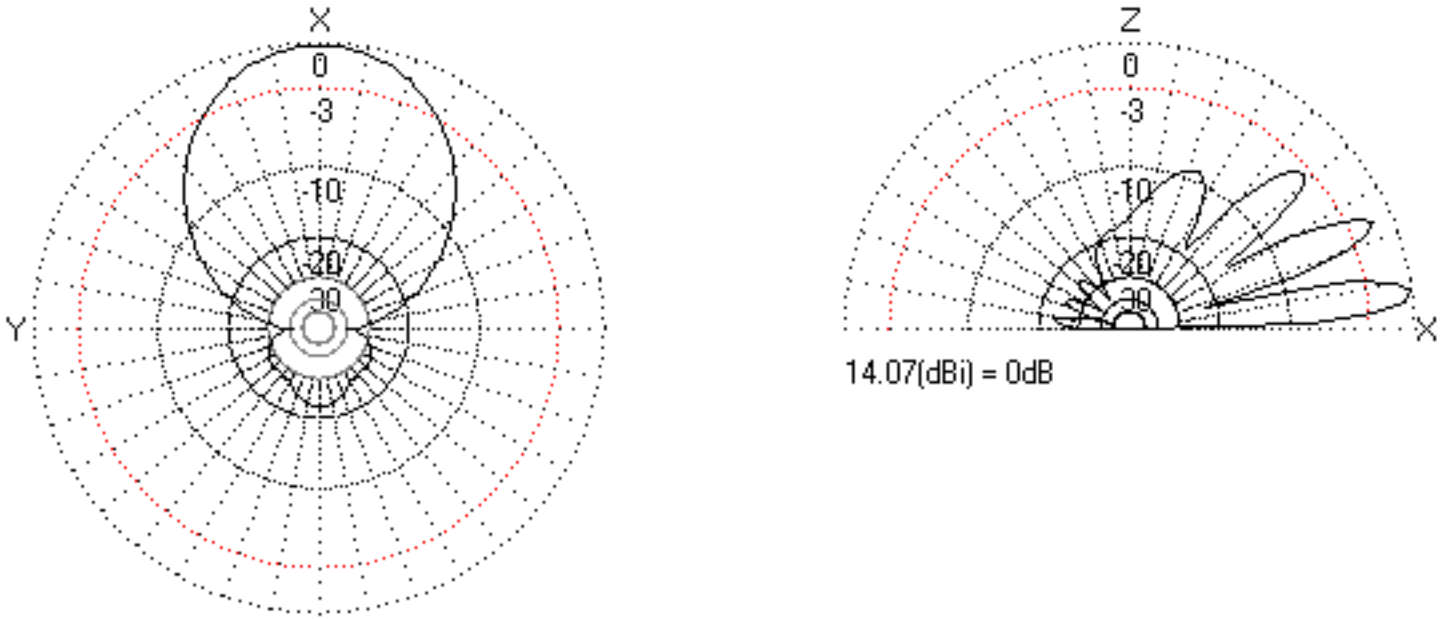
OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
1	29.1 + j0.02	1.72	14.07	22.17	7.7	39.0
2	29.3 - j0.19	1.71	14.05	21.57	7.8	38.0
3	29.6 - j0.23	1.69	14.03	20.53	8.1	37.0
4	29.9 - j0.06	1.67	14.01	19.51	8.3	36.0
5	30.1 + j0.31	1.66	14.0	18.88	8.5	35.0
6	30.0 + j0.68	1.67	13.99	18.81	8.7	34.0



14.07(dBi) = 0dB

Order

Evolution value

OK

Cancel

Optimization log

No goal set(simple sweep)

No.	Z(Ohm)	SWR(50)	Ga(dBi)	F/B(dB)	Elev deg	Vl
1	29.1 + j0.02	1.72	14.07	22.17	7.7	39.0
2	29.3 - j0.19	1.71	14.05	21.57	7.8	38.0
3	29.6 - j0.23	1.69	14.03	20.53	8.1	37.0
4	29.9 - j0.06					36.0
5	30.1 + j0.31					35.0
6	30.0 + j0.68					34.0

Nei prossimi tutorials prenderemo in considerazione la funzione "Plots" del software.

autore reperibile su www.hamradioweb.org/forums

Per non perdere alcuno di questi tutorials , registrati alla community hamradioweb.org, facendo click su questo pulsante.

Order

Evolution value

OK

Cancel