✅ MODEL SETUP

1. New → Model Wizard → 3D
2. Physics → AC/DC → Electromagnetic Fields → Magnetic Fields (mf) → **Add**
3. Physics → Magnetic Fields (mf) → **Add**
4. Study → Frequency Domain → **Done**

✅ GLOBAL DEFINITIONS → PARAMETERS

Set:

- Lx = 70[km]
- Ly = 70[km]
- Lh = 20[km]
- h_box = 10[km]
- w_box = 20[km]
- d_box = 40[km]

✅ GEOMETRY

Block 1

- Width=Lx, Depth=Ly, Height=Lh
- Base=Center, z = −2*Lh
- **Build**

Block 2

- Width=Lx, Depth=Ly, Height=Lh
- Base=Center, z = −Lh
- **Build → Default View**

Block 3

- Width=Lx, Depth=Ly, Height=h_box
- Base=Center, z = −h_box/2
- **Build**

Block 4

- Width=w_box, Depth=d_box, Height=h_box
- Base=Center, x=−w_box/2, z=−h_box/2
- **Build**

Block 5

- Width=w_box, Depth=d_box, Height=h_box
- Base=Center, x=+w_box/2, z=−h_box/2
- **Build**

Form Union

- **Build**

✅ **DEFINITIONS → VARIABLES**

- Variables → Local Variables → Load from file → **magnetotellurics_variables.txt**

✅ **MATERIALS**

Material 1 (default name)

- Domains 2 & 5
- μr=1, σ=0.01 S/m, εr=1
- **Rename to: Rock 100ohmm**

Material 2

- Domain 3
- σ=0.1 S/m
- **Rename to: Rock 10ohmm**

Material 3

- Domain 4
- σ=1 S/m
- **Rename to: Rock 1ohmm**

Material 4

- Domain 1
- σ=10 S/m
- **Rename to: Rock 0.1ohmm**

✅ **BOUNDARY SELECTIONS**

Explicit 1

- Boundaries: 1,4,7,25–27
- **Rename to: x Boundaries**

Explicit 2

- Boundaries: 2,5,8,11–13
- **Rename to: y Boundaries**

Explicit 3

- Boundaries: 10,17,22
- **Rename to: Top**

✅ **PHYSICS — Magnetic Fields (mf)**

Perfect Magnetic Conductor

- Select **y Boundaries**

Magnetic Field

- Select **Top**
- H0 = (0, 1000, 0)

✅ **PHYSICS — Magnetic Fields 2 (mf2)**

Perfect Magnetic Conductor

- Select **x Boundaries**

Magnetic Field

- Select **Top**
- H0 = (1000, 0, 0)

✅ **MESH**

Free Triangular

- Boundaries 1,2,4,5,7,8 → **Build**

Copy Face 1

- Source: 1,4,7
- Destination: 25–27

Copy Face 2

- Source: 2,5,8
- Destination: 11–13

Free Tetrahedral

- Add

Size 1

- Domains 4 –ONLY ANOMALY → Element size = Extra fine
- **Build All**

✅ STUDY

Step 1 (Frequency Domain)

- Frequencies: 0.1 0.01
- Disable solving for **mf2**

Step 2 (Frequency Domain 2)

- Frequencies: 0.1 0.01
- Disable solving for **mf**

Solver Settings

- Solution → Dependent Variables 2
- Defined by: User defined
- Initial values: Initial expression
- Solution: Zero
- Variables not solved for: All
- **Compute**

✅ RESULTS

Cut Plane 1

- z = 0 XY PLANE

- PLOT GROUP
- 2D PLOT GROUP

✅ 2D PLOTS

2D Plot Group 3

- RIGHT CLICK SELECT SURFACE
- Surface expression: log10(rho_xy/1[ohmm])

- Title → **"Apparent resistivity, xy, log scale"**

- **Rename to: Apparent resistivity, xy**

2D Plot Group 4 (SAME STEP AS PREVIOUS DIRECTLY GO TO PLOT GROUP –THEN SURFACE)

- Surface expression: log10(rho_yx/1[ohmm])

- Title → **"Apparent resistivity, yx, log scale"**

- **Rename to: Apparent resistivity, yx**

✅ CUT LINE PLOTS

IN RESULT TOOLBAR

Cut Line 3D

- Point1: x = −35000

- Point2: x = +35000
  THEN TOOLBAR-1D PLOT GROUP

  IN DATA- SELECT CUT LINE 3

  RIGHT CLICK ON 1D PLOT GROUP 5 AND SELECT LINE GRAPH

1D Plot Group 5 (RNAME TO APPARENT RESISTIVITY ACROSS STRIKE)

Line Graph 1–SH0W LEGENDS

- y: rho_xy

- x: x-coordinate (km)
- Legends:
    - 0.1 Hz rho_xy
    - 0.01 Hz rho_xy

Line Graph 2 (duplicate)

- y: rho_yx
- Legends:
    - 0.1 Hz rho_yx
    - 0.01 Hz rho_yx
- Plot group **Rename to: Apparent resistivity across strike**

✅ **SKIN DEPTH PLOT (mf2)**

Delete items

- Multislice 1
- Streamline Surface 1, 2, 3

Slice

- Expression: mf.deltaS (unit: km)
- Plane: zx-plane
- Plane index: 1
- Title → **Skin depth**
- **Rename to: Skin depth**

✅ **TIPPER PLOT (mf)**

Delete items

- Multislice 1
- Streamline Surface 1, 2, 3

CREATE Surface

- Expression: mf.Hz, Z COMPONENT
- Title → **Tipper, z component of H**
- **Rename to: Tipper, z component of H**

FOR PROCMT

https://colab.research.google.com/drive/1olRepvbjuZfWvJbL2L6XmmCOPKD4EkPV?usp=sharing

File upload to Collab (ed.edi)

Priyanshu gupta ka GitHub daalo

First line of file path jo thi, waha pe chale jao...last mein MT_tools mein mein cli.py mein jao

Uncomment commented code, and whi commented code ko naye block mein daalo, and path change kar do (edi file ka path daal do (file is in content mein (sabse upar))) and run it for results