EXPERT GEOPHYSICS

MobileMT forward modeling

from innovations to discoveries

info@expertgeophysics.com www.expertgeophysics.com

Definition: in the case of MobileMT technology, forward modeling is the mathematical simulation of a geoelectrical model which is used to compute natural EM field data in the range of 26-20,000 Hz that would be observed given that model.

Why we are doing it?

- to investigate capabilities of the technology for different exploration problems in different geoelectrical conditions and scenarios.
- Customers of an exploration technique should be aware about its abilities and limitations in some range of targets morphologies, their depths, dimensions, contrasts, overburden challenges in specific exploration conditions.
- During MobileMT data analysis and geological interpretation, we need to know expected exploration models, targets, their features and how they could be reflected in the data, in different frequencies and its inversions.

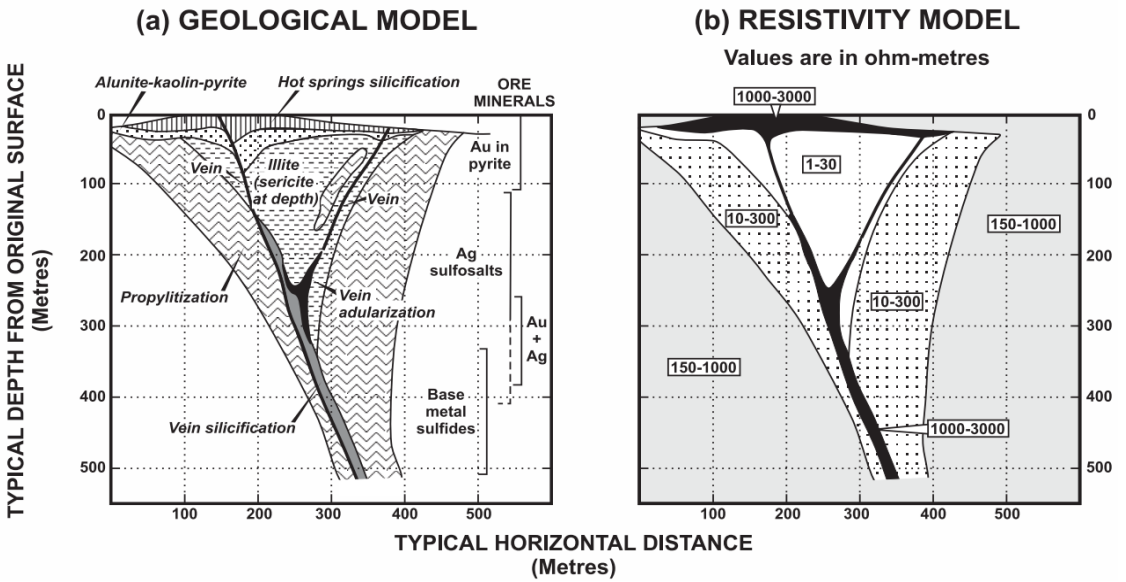
How we are doing it?

The next steps are implemented into the forward modeling procedure:

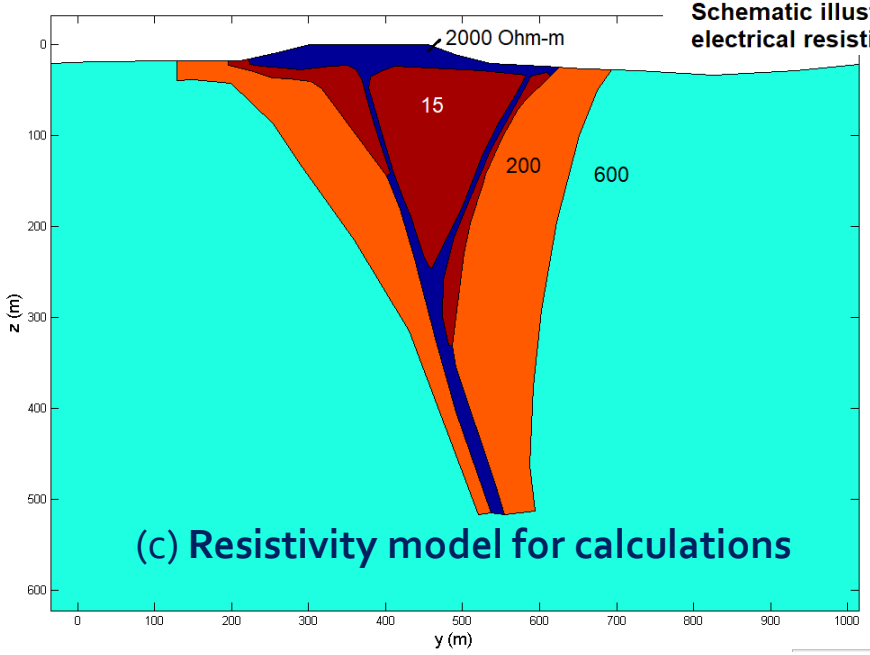
- Development a simplified or fully identical geoelectrical model-section.
- Calculation of MobileMT response (apparent conductivity or apparent resistivities values) for different frequencies along a model.
- Adding gaussian noise into the calculated data (~3%).
- Non-constraint inversion of the calculated+noise field based on the half-space initial model.
- The MobileMT technology is recognized as potentially effective if the inverted data is recovering the initial model or detect the target.

How it works on practice?

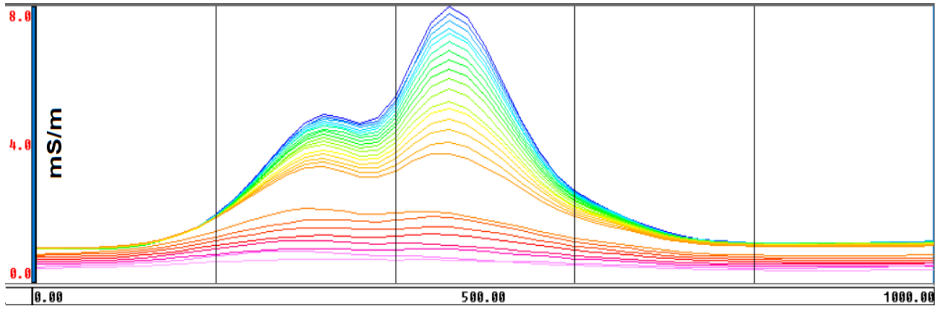
Example – low sulphidation epithermal gold deposit



Schematic illustration of cross-sections of (a) a low sulphidation epithermal gold deposit (b) electrical resistivity associated with the different alteration types (after Williams, P.K., 1997).



(c) **Resistivity model for calculations**



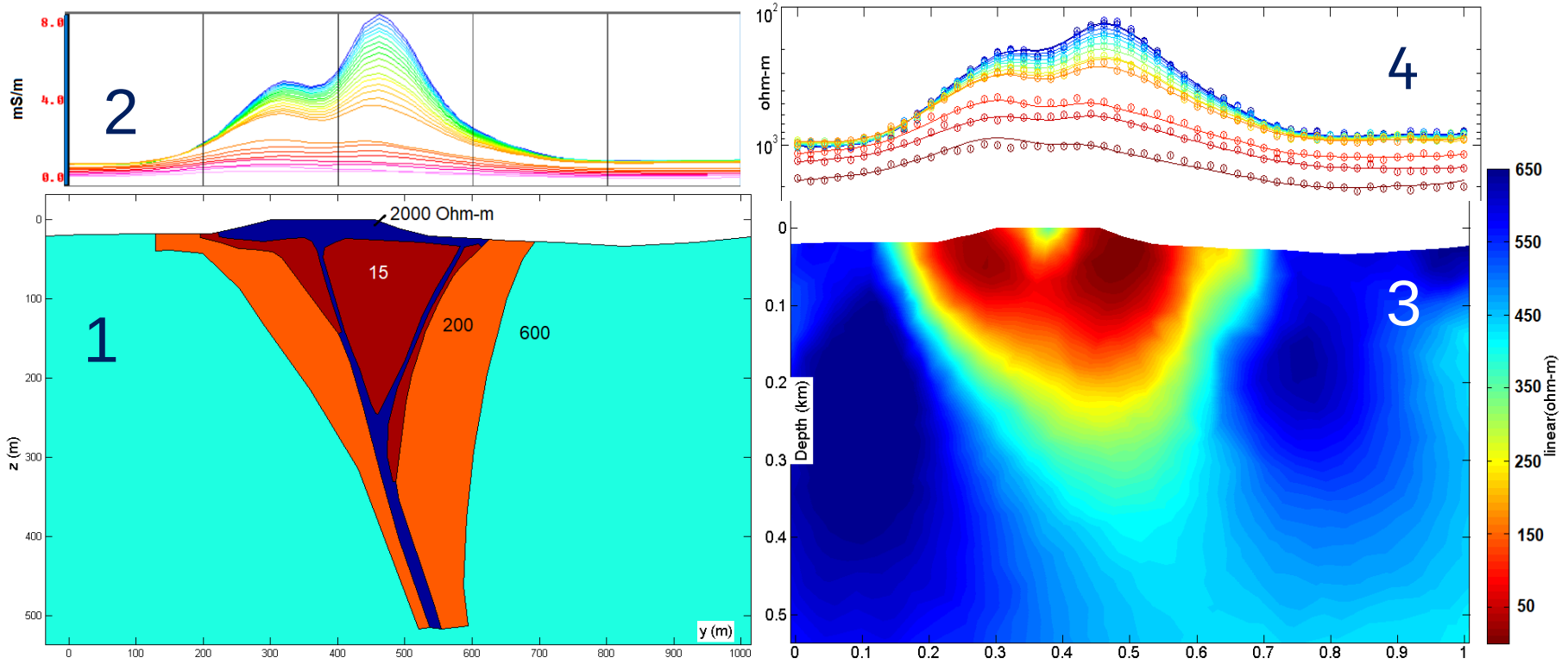
(d) Calculated apparent conductivity profiles from (c) model for different frequencies

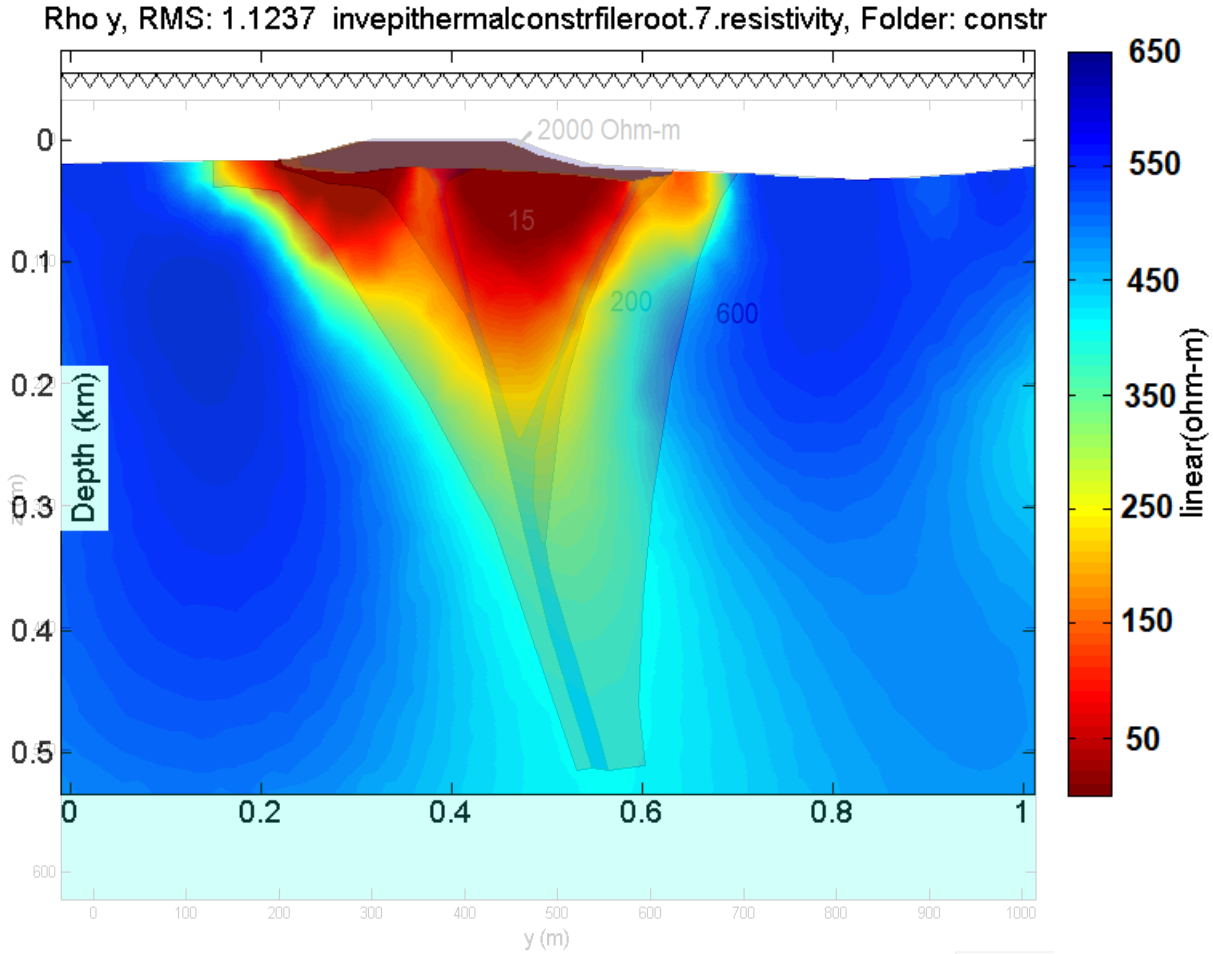
1 – initial resistivity model

2- calculated MobileMT response (app conductivity) from the model ("measured")

3 – inverted resistivity section of the calculated response

4- calculated from the inversion model (lines) and measured (circles) resistivity profiles





Constraining the silica cap (2000 Ohm-m) during the inversion makes the rest part of the section closer to the original model.

Conclusion: the synthetic modeling has shown the MobileMT potential effectiveness in detecting and differentiation the low sulphidation epithermal gold deposit assemblage.

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Please send us your models or sections and we will check MobileMT capabilities in solving your exploration problems.

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