

# ON THE NUMERICAL TREATMENT OF LINEAR AND NONLINEAR INVERSE PROBLEMS IN APPLIED GEOPHYSICS

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This talk is concerned with numerical methods for linear and nonlinear inverse problems that arise in applied Geophysics. The main purpose is to reconstruct the electrical conductivity and the magnetic permeability profiles of the soil by using Electromagnetic induction (EMI) techniques. In particular, we solve the following problem

$$\mathbf{Ax} = \mathbf{b},$$

where  $\mathbf{A} \in \mathbb{R}^{m \times n}$  is a linear/nonlinear operator related to the mathematical model,  $\mathbf{b} \in \mathbb{R}^m$  is the measured data, and  $\mathbf{x} \in \mathbb{R}^n$  is the unknown, i.e. the electrical conductivity and/or magnetic permeability soil profiles.

A MATLAB software including all the numerical procedures have been developed.

This research line is in collaboration with Cagliari Numerical Analysis Group.

## References

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