

Inverse Problems: recent advances in methodology and techniques

Inverse problems arise in a wide range of applications including for instance inverse scattering of acoustic, electromagnetic, elastic or thermal waves, detection of defects inside materials, and identification of parameters in physical, chemical, biological or even financial models. Such problems require specific numerical treatment due to the fact that they are typically

- *ill-posed* in the sense that even small noise in the data may lead to large deviations in the solution; thus regularization has to be applied;
- *large scale* since already the forward problem often consists of a numerically challenging differential or integral equation model;

To cope with these difficulties a variety of computational techniques has been developed and analyzed in the last years. Part of them are specially designed to certain applications, part of them rely on general operator equation formulations. Methodological questions that arise in this context and are supposed to be discussed within this minisymposium are for instance

- adaptive discretization
- stochastic noise models and stochastic convergence analysis
- regularization parameter choice
- characterizations and formulations leading to efficient inversion methods
- hierarchical approaches

The aim of this minisymposium is to bring together experts in the field who have published both on the development of methods and on applications in science and engineering. Therewith we intend to provide a forum for people working on inverse problems and to present recent methodologies to the interested engineering community.