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Inverse Problems with Partial Data

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Message from the Guest Editors

Inverse problems are ubiquitous in science and engineering. In nearly all engineering applications, measurements are taken to infer parameters in certain partial differential equation models that are used to describe the dynamical systems in the forward setting. While the full measurements are ideal for the reconstruction of parameters, in real applications, only partial data, mostly polluted, are available. It is of great significance to theoretically understand the impact of partial polluted data and numerically recover the unknown.

In this Special Issue (SI), we collect several contributions addressing the state-of-art research on this topic. For the numerical aspects, the SI addresses emerging tools from data science, optimization, Bayesian sampling, and machine learning. For the theoretical aspects, it discusses multiple topics, such as stability deterioration due to the partial data, CGO solutions, and qualitative methods. The applications of these methods range from biomedical imaging, geophysics to atmospheric science. The issue provides various angles to examine systems with unknown parameters when only partial information can be measured.

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