A proposal for the

Minisymposium on Inverse Problems

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Synopsis

Over the past two decades, the participation and significance of inverse problems as a research area in computational mechanics have experienced a steady growth. This phenomenon has been spurred not only by the advances in sensor technologies, wireless communications, and signal processing, but also by the necessity to obtain physically-relevant parameters and input for computational models describing the behavior of natural and man-made systems at various scales with ever-growing complexity and sophistication.

This minisymposium aims to gather the state-of-the-art developments in the area of inverse problems as they pertain to computational mechanics. It aims to include, but is not limited to, the computational and mathematical treatment of problems such as

- Inverse scattering (elastic, acoustic, electromagnetic waves...);
- Seismic inversion (migration, tomography, surface wave analysis...);
- Nondestructive material characterization (ultrasound, impact-echo, thermography...);
- Biomedical imaging (tissue elastography via ultrasound or magnetic resonance...);
- Ground-penetrating radar imaging;
- Inverse problems in heat transfer;
- Parameter identification;
- Real-time model updating.

Prospective authors are encouraged to submit papers that emphasize either

i) the development of *new techniques* for solving inverse problems by focusing on aspects such as

- Sensitivity analyses and algorithmic treatments for optimization problems;
- Inverse problems and optimization under uncertainty;
- Probe (sampling) methods for the solution of inverse problems;
- Regularization techniques for ill-posed problems;
- Use of asymptotics for accelerated inverse solutions,

or

ii) the use of e*xisting techniques* toward the solution of challenging real-life applications in terms of e.g.

- Adaptive sensing,
- Multi-mode data inversion;
- Treatment of large-scale inverse problems,
- Material and system characterization at micro- and nano-scales.