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WAVE PROPAGATION AND ASSOCIATED INVERSE PROBLEMS

JAVIER SEGURADO [*] **AND JOAQUIN GARCIA SUAREZ** [†]

[*] IMDEA Materiales
C/ Eric Kandel, 2
Tecnogetafe
28906, Getafe, Madrid (España)
javier.segurado@imdea.org

[†] École polytechnique fédérale de Lausanne
Rte Cantonale, 1015 Lausanne (Switzerland)
joaquin.garciasuarez@epfl.ch

ABSTRACT

The simulation of wave propagation has been a cornerstone of numerical modeling over the past few decades, owing to its importance in diverse fields such as nondestructive evaluation, medical imaging, seismic exploration, and structural health monitoring. Particular attention has been devoted to the associated inverse problems, which aim to infer information about the propagation medium from its response to prescribed excitations. Despite significant progress in the numerical simulation of forward problems, inverse analyses remain inherently ill-posed, computationally demanding, and highly sensitive to modeling uncertainties.

This session aims to bring together researchers engaged in the numerical aspects of wave propagation simulation and its application to inverse wave problems, both contributions centered in advanced inversion/data assimilation strategies or in efficient forward solvers are welcome. Topics of interest include (but are not limited to):

- Reliable and efficient forward solvers for elastic, acoustic, or electromagnetic waves.

- Bayesian inversion methods.

- Adjoint-based sensitivity computations as well as new techniques (e.g., automatic differentiation) to obtain gradient information.

- Model reduction techniques and machine-learning surrogates.

- Applications to engineering problems, including geophysical problems, non destructive testing or bio-medicine.