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NEW TRENDS FOR IMPROVING THE LARGE-SCALE SIMULATION OF WAVE PROPAGATION

1700 - NUMERICAL METHODS AND ALGORITHMS IN SCIENCE AND ENGINEERING

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ABSTRACT

Large-scale simulations of wave propagation are essential for solving real-world problems representing critical societal challenges in various areas including energy, space, environment, and health. Examples of these current challenges are geothermal energy, helioseismology, CO2 storage monitoring, medical imaging, etc. For several decades, increasingly advanced numerical methods have been developed to efficiently solve large-scale problems with high accuracy and significant progress have been made with the aid of supercomputers equipped with modern architectures for high-performance computing. Nowadays, with the advent of exascale machines, new approaches are being proposed to make the most of the capabilities of supercomputers under energy sobriety constraints.

This mini-symposium will provide an opportunity for engineers, scientists, and applied mathematicians to share their new ideas and approaches they have been recently developing for solving large-scale wave propagation problems as well as their findings on wave problems including, direct, inverse, and eigenvalue problems.

Topics of interest include but are not limited to:

- high-order methods,
- time-stepping schemes,
- non-reflecting boundary conditions,
- reduced order modeling

- scientific machine learning
- domain decomposition methods and preconditioning techniques,
- computational strategies for modern parallel computing