

NUMERICAL METHODS FOR WAVE PROPAGATION PROBLEMS

THÉOPHILE CHAUMONT-FRELET* AND MARKUS MELENK†

*Inria Lille

40 Av. Halley, 59650 Villeneuve-d'Ascq, France
theophile.chaumont@inria.fr, tchaumont.github.io

†TU Wien

Wiedner Hauptst. 8, 1040 Wien, Austria
melenk@tuwien.ac.at, <https://www.tuwien.at/mg/asc/melenk>

ABSTRACT

The fast and accurate solution of wave propagation problems remains a challenging obstacle in many applications. Low-order polynomial methods typically deliver poor approximations due to dispersion errors, so that specific numerical schemes are required. This minisymposium will bring together a variety of researchers working on this topic, from the design and analysis of numerical methods to the implementation of solvers.

SPEAKERS

1. A. Bendali (INSA Toulouse): A Mortar Method for the Helmholtz Equation: Stability, Convergence, and an Ultra-Weak Variational Formulation Interpretation
2. O. Bruno (Caltech) Efficient time-domain scattering synthesis via frequency-domain singularity subtraction
3. B. Despres (LJLL Sorbonne U.) Old thoughts and new results on Trefftz methods for wave problems
4. C. Engstrom (Linnaeus U.) Fast and Reliable Computation of Scattering Resonances in Open Systems
5. M. Gander (U. Geneva) The Method of Reflections for Wave Propagation Problems

6. A. Gillman (U. Colorado Boulder) Efficient solvers for multilayered media scattering problems
7. M. Hauck (Karlsruhe Institute of Technology) Numerical methods for the elastic wave propagation in spatial networks
8. P. Henning (Ruhr-University Bochum) Numerical vortex resolution for rapidly rotating Bose-Einstein condensates
9. D. Hewett (U. College London) Waves in fractal domains: A discontinuous Galerkin method with fractal elements
10. M. Houlette (CERMICS, ENPC) Sharp a priori error estimates for upwind DG discretization of time-harmonic wave problems
11. G. Li (U. Hong Kong) Numerical homogenization for indefinite time-harmonic Maxwell equations
12. C. Ma (Great bay U.) Domain decomposition preconditioners with spectral coarse spaces for time-harmonic heterogeneous Maxwell's equations
13. P. Monk (U. Delaware) Coupling finite element methods with the UWVF for Maxwell's equations
14. C. Perez-Arancibia (U. Twente) Fast high-order solvers for the Lippmann–Schwinger equation in piecewise-smooth heterogeneous media
15. M. Shaqfa (ETH Zurich) Spectral FEM and BEM for Helmholtz problems
16. E. Spence (U. Bath) Two-level Schwarz preconditioners with piecewise-polynomial coarse spaces for the high-frequency Helmholtz equation
17. P. Stocker (U. Vienna) Sweeping preconditioners for Trefftz-DG methods
18. A. Tonnoir (INSA Rouen) Dispersion correction methods for elastodynamics
19. Li-Lian Wang (NTU Singapore) Robust radial PML-type techniques for time-harmonic acoustic and elastic wave scattering problems