

HIGH-ORDER NUMERICAL SOLVERS FOR WAVE SCATTERING PROBLEMS

OSCAR P. BRUNO*, CONSTANTINE SIDERIS[†], TAO YIN[‡]

*Department of Computing & Mathematical Sciences, California Institute of Technology
1200 East California Blvd., CA 91125, United States
obruno@caltech.edu

[†]Department of Electrical Engineering, Stanford University
Stanford, California 94305, United States
sideris@stanford.edu

[‡]State Key Laboratory of Mathematical Sciences and Institute of Computational
Mathematics and Scientific/Engineering Computing, Academy of Mathematics and
Systems Science, Chinese Academy of Sciences
55 ZhongGuanCunDongLu, Beijing 100190, China
yintao@lsec.cc.ac.cn

ABSTRACT

Wave scattering problems in acoustics, elastodynamics, and electromagnetics arise across a broad spectrum of applications, where intricate mathematical challenges and numerical complexities often demand sophisticated methodologies. Substantial research efforts have been devoted to numerical solution strategies by both mathematical and engineering communities. This symposium aims to bring together researchers to exchange ideas and discuss recent advances in the computational modeling and simulation of complex wave scattering problems utilizing high-order schemes.

SPEAKERS

1. Thomas Anderson (Rice University): Fast and stable high-order accurate volume density interpolation methods for volume potentials
2. Juan Sebastián Burbano-Gallego (University of Twente): Efficient Preconditioning for High-Order Lippmann–Schwinger Solvers in Piecewise-Smooth Heterogeneous Media

3. Jinghao Cao (Imperial College London): XXX
4. Dan Givoli (TechnionIsrael Institute of Technology): Symmetric Finite Element Schemes for High-Order Absorbing Boundaries
5. Thorsten Hohage (Georg-August-Universität Göttingen): XXX
6. Wangtao Lu (Zhejiang University): A high accurate BIE method for wave scattering by analytic surfaces
7. Peter Monk (University of Delaware)
8. Nilima Nigam (Simon Fraser University): Preconditioning Trefftz methods for 2-D acoustics
9. Ambuj Pandey (Indian Institute of Science Education and Research Bhopal): A fast high-order Truncated Fourier Filtering method for evaluation of integrals and convolutions in general domains
10. Manuel Santana (California Institute of Technology): Efficient simulation of scattering from trapping obstacles via a two-level preconditioner for boundary integral equations
11. Sabhrant Sachan (California Institute of Technology): Weakly Singular Formulation of the Fractional Laplacian and Associated High-Order Numerical Algorithms
12. Catalin Turc (New Jersey Institute of Technology)
13. Liwei Xu (University of Electronic Science and Technology of China): Computational nanoscale electromagnetics
14. Tao Yin (Academy of Mathematics and Systems Science, Chinese Academy of Sciences): Open-arc scattering problems: edge singularities and high-accuracy integral equation solver
15. Hai Zhang (Hong Kong University of Science and Technology): A covariance-based reduced order method for scattering problems
16. Weiyang Zheng (Academy of Mathematics and Systems Science, Chinese Academy of Sciences): XXX
17. Andrew Peterson (Georgia Institute of Technology): XXX
18. Eric Michielssen (Yale University): XXX

19. Thomas Eibert (Technical University of Munich): XXX
20. Simon Adrian (University of Rostock): XXX