

Analysis and Applied Mathematics Seminar

Simulating Multilayer Plasmonic Devices with Domain Decomposition Methods: High-Order Perturbation of Surfaces Implementations

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Abstract: The faithful modeling of the propagation of linear waves in a layered, periodic structure is of paramount importance in many branches of the applied sciences, in particular, in the simulation and design of multilayer plasmonic devices. In this talk we present a novel numerical algorithm for the simulation of such problems which is free of the artificial singularities present in related approaches. We advocate for a non-overlapping domain decomposition method (DDM) phrased in terms of Impedance-Impedance Operators that are immune to the Dirichlet eigenvalues which plague the Dirichlet-Neumann Operators that appear in classical formulations. We demonstrate a High-Order Spectral algorithm to simulate these operators based upon a High-Order Perturbation of Surfaces methodology which is rapid, robust, and highly accurate. We demonstrate the validity and utility of our approach with a sequence of numerical simulations.

Monday, February 18 at 4:00 PM in 636 SEO