

Compressing variable-coefficient exterior Helmholtz problems via RKFIT

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The efficient discretization of Helmholtz problems on unbounded domains is a challenging task, in particular, when the wave medium is nonhomogeneous. We present a new numerical approach for compressing finite difference discretizations of such problems, thereby giving rise to efficient perfectly matched layers for nonhomogeneous media. This approach is based on the solution of a nonlinear rational least squares problem using the recently developed RKFIT method. We show how the solution of this least squares problem can be converted into an accurate finite difference grid within a rational Krylov framework. This is joint work with Vladimir Druskin and Leonid Knizhnerman.