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# Spectral approaches to d-bar systems

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## Abstract

We discuss numerical approaches to d-bar systems appearing in the context of electrical impedance tomography and the inverse scattering theory of the Davey-Stewartson II equation. The approaches are spectral, i.e., the numerical error decreases exponentially with the resolution for functions being smooth on the considered domains. We present algorithms for the case of potentials in the Schwartz class of rapidly decreasing smooth functions, and for functions with compact support. In the first case we consider Fourier techniques with an analytical regularization of the singular integrands combined with Krylov subspace techniques. In the second case we use polar coordinates and Fourier techniques in the angular variable and polynomial interpolation in the radial variable. This is a joint work with Olga Assainova, Johannes Sjostrand, Nikola Stoilov from IMB Dijon, Ken McLaughlin from Colorado State University and Peter Miller from Michigan University

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