Tomographic inverson with wavelets and ℓ_1-norm penalization

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Abstract

We propose the use of ℓ_1 regularization in a wavelet basis for the solution of linearized seismic tomography problems $Am = d$, allowing for the possibility of sharp discontinuities superimposed on a smoothly varying background. An iterative method is used to find a sparse solution m that contains no more fine-scale structure than is necessary to fit the data d to within its assigned errors. We also discuss possible ways to accelerate the convergence of this algorithm.