

Multiharmonic expansions for nonlinearity identification in wave type equations

Thursday, 6 July 2023 14:35 (25 minutes)

We consider an undetermined coefficient inverse problem for a nonlinear partial differential equation occurring in high intensity ultrasound propagation as used in acoustic tomography.

In particular, we investigate the recovery of the nonlinearity coefficient commonly labeled as B/A in the literature, which is part of a space dependent coefficient κ in the Westervelt equation governing nonlinear acoustics.

Corresponding to the typical measurement setup, the overposed data consists of time trace measurements on some zero or one dimensional set Σ representing the receiving transducer array.

In this talk, we will show some recent results pertaining to the formulation of this problem in frequency domain and numerical reconstruction of piecewise constant coefficients in two space dimensions.

This is joint work with Bill Rundell, Texas A&M University.

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