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Anh-Khoa Vo* (anhkhoa.vo@uncc.edu). *Convexification for an inverse scattering problem with the moving point source.*

In this talk, we present the globally convergent convexification numerical method for a coefficient inverse problem for the three-dimensional Helmholtz equation for the case when the backscattering data are generated by a point source running along an interval of a straight line and the wavenumber is fixed. Our approach relies on a new derivation of a boundary value problem for a system of coupled quasilinear elliptic partial differential equations. This is done via an application of a special truncated Fourier-like method. First, we prove the Lipschitz stability estimate for this problem via a Carleman estimate. Next, using the Carleman weight function generated by that estimate, we construct a globally strictly convex cost functional and prove the global convergence to the exact solution of the gradient projection method. Finally, our theoretical finding is verified via several numerical tests with experimental data. (Received December 27, 2020)