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Dinh-Liem Nguyen* (dnguye70@uncc.edu), **Michael Klibanov**, **Loc Nguyen**, **Aleksandr Kolesov**, **Michael Fiddy** and **Hui Liu**. *A globally convergent numerical method for an inverse scattering problem with multi-frequency data.*

We consider the inverse problem of determining the spatially distributed dielectric constant of three-dimensional scattering objects from experimental multi-frequency data corresponding to a single incident wave. The challenges for the inverse problem under consideration are not only from its nonlinearity and high ill-posedness but also from the fact that the experimental data have a huge misfit with data obtained in simulations. We present in this talk how the raw data can be preprocessed and successfully inverted using a globally convergent numerical method. More precisely, we are able to reconstruct the dielectric constant of the scattering medium with a reasonable accuracy as well as its geometric information such as location and size without using any detailed a priori knowledge of physical and geometrical properties of the medium. We note that the latter feature is the essential difference between our globally convergent approach and nonlinear optimization approaches, which are often referred to as locally convergent methods for inverse problems. (Received September 12, 2016)