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Fioralba Cakoni* (fcakoni@udel.edu), 505 Ewing Hall, Department of Mathematical Sciences, University of Delaware, Newark, DE 19716. *A Qualitative Approach to the Inverse Scattering Problem for Inhomogeneous Media.*

Since the introduction of the linear sampling method in 1996 followed by the factorization method in 1998 and later the first proof of the existence of transmission eigenvalues in 2008, qualitative methods have become a popular method for solving inverse scattering problems. Interest in this area has exploded and the vast amount of literature currently available is an indication of the myriad directions that this research has taken. In this talk we consider the inverse scattering problem for an inhomogeneous (possibly anisotropic) media and show how to obtain information about the support as well as the physical properties of the media based on the investigation of the corresponding far field operator. In particular, we will discuss the relevance and state of the art of the transmission eigenvalue problem and present what type of information transmission eigenvalues provide about the inhomogeneity. (Received January 14, 2015)