On Non-scattering Anisotropic Inhomogeneities

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The non-scattering phenomenon is closely related to uniqueness question in inverse scattering theory. In this talk we present necessary conditions for an anisotropic inhomogeneous medium to be non-scattering at a single wave number and for a single incident field. These conditions are expressed in terms of the regularity of the boundary of the inhomogeneity. We assume that the coefficients, characterizing the constitutive material properties of the medium, are sufficiently smooth, and the incident wave is appropriately non-degenerate. Our analysis utilizes the Hodograph transform as well as regularity results for nonlinear elliptic partial differential equations. We present some interesting examples of non-scattering that are particular to the anisotropic media.