Singularity Helps for Shape Identification

Guanghui Hu

Division of Applied and Computational Mathematics, Beijing Computational Science Research Center, China

Email: hu@csrc.ac.cn

Assume a time-harmonic incoming wave is incident onto an inhomogeneous isotropic medium with a compactly supported contrast function. If the scattering interface possesses a singular point (for instance, corners, edges, circular conic corners and other non-analytical points), we prove the absence of any real non-scattering wavenumber. This implies that the presence of singularity helps for imaging the shape of an unknown penetrable obstacle. Global and local uniqueness results will be shown.