Inverse Scattering for the Time Dependent Wave Equation

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We develop the generalized linear sampling method for recovering the support of a scattering object using time dependent far field measurements. This method provides mathematically rigorous characterization of the support of the scatterer, and is also justified for noisy data. The use of time domain measurements is a remedy for large amount of spatial data typically needed for the application of qualitative reconstruction methods in inverse scattering theory. We will also discuss some latest results on the solvability of the time domain interior transmission problem, which is the fundamental tool for the inverse scattering for inhomogeneous media in the time domain. This talk will be based largely on the joint work with Houssem Haddar and Armin Lechleiter.