

Resolution and the Linear Sampling Method

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The linear sampling method (LSM) is a visualization scheme for frequency domain inverse problems that provides an image of the profile of the scatterer. In particular, the method consist of plotting the norm of a regularized solution, g , to a linear Fredholm equation of the first kind at points in a grid that cover a region where the unknown scatterer is thought to be located. The profile of the scatterer is then characterized by the fact that the norm of g increases without bound as the sampling points approach the boundary of the scatterer. A tremendous advantage of the LSM is that it is not computationally expensive to implement and no a priori knowledge of the physical traits of the scatterer are needed. It is, however, the case that several questions remain regarding the choice of sampling grid and the effects on the resolution of the profile. This talk will focus on both illustrating the difficulties that one may encounter as well as offer possible solutions to this problem.