How to avoid eigenvalues in the factorization method for inverse scattering problems

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The factorization method for scattering problems in the frequency domain constructs a criterium to decide whether or not a point z is in the support of the scatterer. For non-absorbing scatterers as, e.g. the scattering by an ideal conductor, one has to assume that the wave number is not an eigenvalue of an underlying eigenvalue problem. Somehow this is similar to the classical integral equation method for solving boundary value problems for the Helmholtz equation which led to the use of modified forms of the unknown fields. In our talk we will show how to modify the factorization method such that the assumption on the wave number can be removed.