

# A boundary integral method for high frequency acoustic scattering in three dimensions

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August 10, 2004

This talk is concerned with the numerical solution of problems of scattering of high frequency time-harmonic acoustic waves by convex three-dimensional objects with smooth boundaries. Reformulating as a second kind boundary integral equation and separating out the leading order oscillatory behaviour of the solution leaves a slowly oscillating function to be approximated. The key component of our scheme is then the fast and accurate evaluation of highly oscillatory weakly singular integrals. Our approach is based on a combination of the method of stationary phase and exact treatment of singularities, using a singularity division technique in an appropriate coordinate system, with special care being needed when the observation point lies close to the shadow boundary.