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Catalin Turc* (turc@acm.caltech.edu), Department Of Mathematics UNC Charlotte, 376 Fretwell Bldg., 9201 University City Blvd., Charlotte, NC 28223, and **Oscar Bruno, Tim Elling** and **Randy Paffenroth**. *Acoustic and electromagnetic integral equations requiring small numbers of Krylov-subspace iterations.*

We present a new class of integral equations for the solution of problems of scattering of acoustic and electromagnetic fields by sound-hard and perfectly conducting bodies. Unlike the classical Combined Field Integral Equations, the operators underlying these novel integral equation formulations possess excellent spectral distributions—with closely clustered eigenvalues—so that small numbers of iterations suffice to solve the corresponding equations by means of Krylov subspace iterative solvers such as GMRES. A variety of numerical results demonstrate that, for a given accuracy, the new equations can give rise to order-of-magnitude reductions in computational costs over those resulting from previous approaches. (Received August 08, 2007)