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Louis Fishman* (Shidi53@aol.com), Code 7181, Naval Research Laboratory, Stennis Space Center, MS 39529, **M. V. de Hoop** (mdehoop@dix.mines.edu), Center for Wave Phenomena, Colorado School of Mines, Golden, CO 80401, and **P. M. Jordan** (pjordan@nrlssc.navy.mil), Code 7181, Naval Research Laboratory, Stennis Space Center, MS 39529. *Exact Constructions of Square-Root Helmholtz Operator Symbols.*

The square-root Helmholtz operator symbol plays a pivotal role in both the exact, well-posed, one-way reformulation of solving the elliptic, Helmholtz wave equation and the construction of the generalized Bremmer coupling series. This operator symbol is the initial quantity of interest in both formulations, in addition to providing the theoretical framework for the development and implementation of the "parabolic equation" (PE) method in wave propagation modeling. Representing a singular operator, this symbol satisfies a quadratically nonlinear, nonlocal composition equation in an appropriate pseudodifferential operator calculus. The applications to direct and inverse problems ultimately focus on the oscillatory and singular structure of the function. In this talk, exact constructions of the square-root Helmholtz operator symbol will be presented for (1) both the focusing and defocusing quadratic profiles and (2) several examples of piecewise constant profiles including the limiting case of the delta function profile. These results will be used to illustrate several pertinent issues in both direct and inverse wave propagation modeling. (Received September 20, 2000)