

Meeting: 1005, Newark, Delaware, SS 13A, Special Session on Integral and Operator Equations

1005-45-186 **George C Hsiao*** (hsiao@math.udel.edu), Department of Mathematical Sciences, University of Delaware, Newark, DE 19716, and **Wolfgang L Wendland** (wendland@mathematik.uni-stuttgart.de), Inst. Angewandte Analysis u Numer. Simulation, University of Stuttgart, D-70511 Stuttgart, Germany. *Boundary Integral Equations Recast as Pseudodifferential Equations.*

It is known that the treatment of boundary value problems based on variational principles often leads to corresponding boundary integral equations in weak formulations. Their mapping properties can then be derived from those of the associated partial differential equations. However, this approach is restricted only to those boundary value problems which can be formulated in terms of general variational principles based on Gårding's inequality. On the other hand, boundary integral equations can also be recast as special classes of pseudodifferential equations. In this paper, we are concerned with the latter approach by applying pseudodifferential operator theory to a class of elliptic boundary value problems. In particular, the boundary value problems for the Helmholtz equation of scattering theory and the Lamé equations of linear elasticity will serve as model problems for illustrating the basic ideas how one can apply the theory of pseudodifferential operators and their calculus to obtain basic solution properties for the boundary integral equations. (Received February 08, 2005)