1038-65-220 **Peter B Monk*** (monk@udel.edu), Department of Mathematical Sciences, University of Delaware, Newark, DE 19716. *Hybridization of Finite Element Methods for the Helmholtz Equation.* Preliminary report.

When finite elements are applied to approximate the solution of the Helmholtz equation we are faced with the problem of solving a large sparse system that is neither Hermitian or positive definite (it is usually complex symmetric). Standard iterative methods become increasingly inefficient as the wave number increases. In particular multigrid methods are not optimal. In this paper we investigate the use of hybridized Raviart-Thomas elements for this problem. We show that one version of this scheme is equivalent to a discontinuous Galerkin method called the Ultra Weak Variational Formulation, and hence can be used to couple between standard elements and specialized plane wave elements. The resulting scheme shows promise in controlling the number of iterations of GMRES as the wave number increases. (Received February 10, 2008)