A WAVELET GALERKIN METHOD FOR AN ELECTROMAGNETIC SCATTERING FROM A LARGE CAVITY PROBLEM

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In this talk, we shall present a wavelet Galerkin method for solving the 2D Helmholtz equation with a non-local boundary condition. Such an equation is obtained by imposing several simplifying physical assumptions on an electromagnetic scattering from a large cavity problem. In practice, we encounter this scattering problem in stealth/tracking technology. We shall construct 1D Riesz wavelets on a bounded interval, which by the tensor product, form a 2D Riesz wavelet used in our Galerkin method. Furthermore, we shall demonstrate how this method can be easily implemented. Finally, some numerical experiments are presented to show how the coefficient matrix of our wavelet Galerkin method is much better conditioned than that of a standard Galerkin method. This implies a faster convergence rate when iterative schemes are used.