

Meeting: 998, Houston, Texas, SS 18A, Special Session on Designing Frames and Wavelets: From Theory to Digitization

998-65-242 **Shijun Zheng*** (szheng@math.lsu.edu), Department of Mathematics, Louisiana State University, Baton Rouge, LA 70803, **Dennis Healy**, Department of Mathematics, University of Maryland, College Park, MD 20742, and **Ioannis Konstantinidis**, Institute of Informatics and Technology, University of Houston, Houston, TX 77204. *Operator Reconstruction in Wavelet Bases and Its Use in Partial Differential Equations.*

We give a survey on recent development on wavelet-based numerical solution of time-dependent partial differential equations. The fundamental idea is to use wavelet to give sparse representations of the solution operators involved. Thus it leads to a fast algorithm for efficient approximation of the solution to the *PDE*. We demonstrate the general scheme by considering the anisotropic diffusion equation arising in thin film image processing. Among other examples are advection-diffusion equations arising in *CFD*. Numerical results are presented. (Received February 28, 2004)