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**Jianguo Liu\*** (jliu0@math.sc.edu), Department of Mathematics, University of South Carolina, Columbia, SC 29208. *Wavelet Schemes for Advection-Reaction Equations.*

We combine techniques of wavelet analysis and Eulerian-Lagrangian localized adjoint method (ELLAM) to develop unconditionally stable, explicit numerical schemes for advection-reaction partial differential equations in multiple space dimensions. These include single level schemes, multi-level schemes, and multi-level schemes that can carry out adaptive compression without introducing mass balance error. These schemes produce accurate numerical solutions even if large time steps are used. One- and two-dimensional computational results are presented to show the strong potential of the numerical schemes developed. (Received October 02, 2000)