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Adnan H Sabuwala* (asabuwala@csufresno.edu). *Spectrally Matched Grids: Anisotropy and Semi-Infinite Spectral Intervals.*

Traditional finite-difference techniques using uniform grids for numerical solution of PDE's are slow and compute the solution over the entire problem domain. However, for receiver-targeted applications such as geophysical exploration, one wishes to compute faster solutions to PDE's at specific receiver locations with high accuracy. Spectrally matched non-uniform grids have been shown to achieve super exponential convergence for such problems. In this talk, we give an introduction to the method of computing spectrally matched grids. We then use these grids to compute solutions to anisotropic problems. We also introduce a new set of non-uniform grids called Remes grids and exhibit their convergence. These grids can be used to solve problems over semi-infinite spectral intervals such as with a delta function signal source. Numerical experiments have been conducted and their results presented in this talk. (Received September 25, 2012)