

1048-65-231

Sorin M. Mitran* (mitran@unc.edu), Department of Mathematics, CB 3250, Chapel Hill, NC 27599. *A fresh look at dispersion-preserving, compact schemes using the Z-transform.* Preliminary report.

A number of physical phenomena require accurate modeling in both spectral and real space. Dispersion relation preserving and spectral schemes have reached a high degree of development for such applications. Both are based upon Fourier expansions of the field variables of interest. Ideally suited for periodic boundary conditions, the modifications required to deal with general domains are often cumbersome. The Fourier transform itself is the restriction to the unit circle of the Z-transform. An investigation of how compact, dispersion relation preserving schemes can be derived from the Z-transform is presented along with applications to wave propagation and turbulence modeling. (Received February 09, 2009)