

Title: **Chapter 18 - ENO and WENO Schemes**

Author: **Ekaterinaris, John A.**

Published in: Effective computational methods for wave propagation, 521–592, Numer. Insights, 5, Chapman & Hall/CRC, Boca Raton, FL, 2008. 65M06 (76M12 76M20)

Review by: Mario Forcinito

ENO (essentially non-oscillatory) and WENO (Weighted ENO) schemes are almost indispensable in applications involving the solution of hyperbolic equations having piecewise smooth solution that contain discontinuities, such as aero-acoustics and computational electromagnetics. Prof. Ekaterinaris delivers a solid and detailed presentation of the principles involved in the development of ENO and WENO schemes. Both, Finite Volume and Finite Differences schemes are covered.

Although starting with a detailed description of one-dimensional cases, the way to extend the schemes to multidimensional problems and non-uniform grids is well documented. In addition the OWENO (Optimized WENO) CWENO (Compact WENO) and Hybrid CWENO schemes are described. Several examples and relevant measures of accuracy vs. computational are included, as well as examples of applications to practical problems.

The chapter ends with a description of state of the art applications of these schemes.