Eighth Mississippi State - UAB Conference on Differential Equations Computational Simulations, May 7–9, 2009, Department of Mathematics and Statistics, Mississippi State University, Mississippi State, MS, USA

Coauthors: Dr Roy Koomullil

# EXPLORING USE OF WEIGHTED ESSENTIALLY NON-OSCILLATING SCHEMES FOR GENERALIZED MESHES

DEEPAK KINI

Advances in the field of high performance computing and availability of larger cluster of computers enabled the use of computational field simulations for routine engineering analysis. Along with this growth, the complexity of the problems that are analyzed using computational techniques is also increased. This necessitated resolving finer details of the flow field to capture the physics of the problem. A few examples of this class of applications include helicopter tip vortex interaction, complex vortex interaction around flapping wings, transition to turbulence, and large eddy simulation. One of the requirements for resolving these flows is the capability for higher order discretization of flow field variables. The Weighted Essentially Non-Oscillating (WENO) schemes have been developed with this in focus. WENO schemes have been successfully applied to simulation of various problems using structured meshes. A few on-going research efforts have been reported in the application of WENO schemes for unstructured meshes. However, the applications of WENO schemes for generalized meshes have not been published in the literature. This paper presents a summary of WENO schemes applied to unstructured meshes and addresses the extension of WENO scheme for unstructured meshes to generalized meshes. This will provide an approach for combining the flexibility of generalized meshes with the capability of higher order of accuracy of WENO schemes to capture complex flow phenomenon.

University of Alabama at Birmingham
*E-mail address*: dvkini@uab.edu