1109-76-291 **Sarma L Rani*** (sarma.rani@uah.edu), Department of Mechanical and Aerospace Engr, Huntsville, AL 35899, and **Shreyas Bidadi** (sb0028@uah.edu), Department of Mechanical and Aerospace Engr, Huntsville, AL 35899. *On the stability and diffusive characteristics of Roe-MUSCL and Runge-Kutta schemes for Implicit LES.*

Monotonically integrated large-eddy simulation (MILES) approach utilizes the dissipation inherent to shock-capturing schemes to emulate the role played by explicit subgrid-scale eddy diffusivity at the high-wavenumber end of the turbulent energy spectrum. In the current study, a novel formulation is presented for quantifying the numerical viscosity inherent to Roe-based second-order TVD-MUSCL schemes for the Euler equations. Using this formulation, the effects of numerical viscosity and dissipation rate on implicit large-eddy simulations of turbulent flows are investigated. At first, the three-dimensional (3-D) finite-volume extension of the original Roe's flux, including Roe's Jacobian matrix, is presented. The fluxes are then extended to second-order using van Leer's MUSCL extrapolation technique. Starting from the 3-D Roe-MUSCL flux, an expression is derived for the numerical viscosity as a function of flux limiter and characteristic speed for each conserved variable, distance between adjacent cell centers, and a scaling parameter. A detailed investigation was performed of decaying homogeneous isotropic turbulence with varying degrees of compressibility. Spectra of numerical viscosity and dissipation rate are presented. (Received February 03, 2015)