1135-65-1852 **Samet Y Kadioglu*** (`kadioglu@yildiz.edu.tr`), Yildiz Technical University, Department of Mathematical Engineering, Davutpasa-Esenler, Istanbul, Turkey. *A High Resolution Numerical Algorithm for Fluid Flows.* Preliminary report.

We present a high resolution numerical algorithm based on the Spectral Deferred Corrections (SDC) time integration technique and the Essentially Non-Oscillatory (ENO) finite volume method for the compressible fluid flow applications. The SDC technique is used to advance the solutions in time with high-order of accuracy. The ENO method is used to calculate numerical fluxes with non-oscillatory fashion. We have tested the new SDC-ENO technique by solving several test problems involving moderate to strong shock waves and smooth/complex flow structures [3]. Our numerical results show that we have numerically achieved the formally fourth-order convergence of the new method for smooth problems. Our numerical results also indicate that the newly proposed technique performs very well providing highly resolved shock discontinuities and fairly good contact solutions. More importantly, the discontinuities in the flow test problems are captured with essentially no-oscillations. We have numerically compared the fourth-order SDC-ENO scheme to the fourth- order SDC-PPM method for the same test problems. The results are similar for most of the tests except in some cases the SDC-PPM method suffers from minor oscillations compared to SDC-ENO scheme being completely oscillation free. (Received September 25, 2017)