1048-76-250 **Sorin M. Mitran*** (mitran@unc.edu), Department of Mathematics, CB 3250, Chapel Hill, NC 27599. *Adaptive mesh refinement for turbulent flow computations.* Preliminary report.

Fully developed turbulence is characterized by the presence of a large range of flow scales. Hence it would seem futile to employ adaptive mesh refinement (AMR) on the argument that a fine mesh would be needed everywhere. However, the prevalence of coherent structures in many turbulent flows offers opportunities for an AMR approach. The goal would be to capture the large scale structure and cut off additional refinement when some simple model (e.g. eddy viscosity) can be confidently applied. In many ways this is reminiscent of large eddy simulation, but the creation of additional grid levels brings about some new aspects with regard to how prolongation and restriction operators are defined. Standard linear interpolation of coarse grids to subgrids constitutes an artificial excitation of fine scales which vitiates the overall model. Similarly, cell average coarsening leads to spurious excitation at coarse-fine boundaries. Finally, the usual AMR refinement criteria do not apply and have to be reformulated as ascertaining the validity of a subgrid stress model. An AMR approach which addresses these issues is presented along with results for channel flow. (Received February 09, 2009)