EFFECTS OF SUBSCALE FLOW STRUCTURE ON NUMERICAL SIMULATION OF COMPRESSIBLE FLOWS

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The accurate simulation of large scale flow features is important when using Computational Fluid Dynamics (CFD) in practical applications involving compressible flows. While the emphasis in evaluating numerical code capabilities has been on the resolution of small scale flow features, from an application standpoint it is more important to correctly model the large scale flow behavior. In complex problems, some part of the flow structure will always be below the mesh resolution and will not be properly modeled. The effect of this loss of subgrid resolution on the larger scale flow behavior needs to be better understood. A test problem is proposed to evaluate the capability of numerical codes to maintain accurate description of large scale flow features in situations where they are dependent on subscale flow features.