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Anisotropic Turbulent Flow Simulations using the Isotropic LANS-α Equations KAMRAN MOHSENI, University of Colorado at Boulder — Direct numerical simulation of most engineering and geophysical turbulent flows requires intensive computations. Large Eddy Simulations (LES), Reynolds Averaged Navier-Stokes Equations (RANS), and the Lagrangian averaged Navier-Stokes-α (LANS-α) equations are among the numerical techniques to reduce the computational intensity of turbulent flow calculations. In this talk a *dynamic* procedure for the Lagrangian Averaged Navier-Stokes-α (LANS-α) equations is developed where the variation in the parameter α in the direction of anisotropy is determined in a self-consistent way from data contained in the simulation itself. In order to evaluate the applicability of the dynamic LANS-α model in anisotropic turbulence, *a priori* test of the dynamic LANS-α in channel flows is performed at various Taylor Reynolds numbers between 180 and 550 based on the wall friction velocity to find the variation of α in the wall-normal direction. It is found that in the wall region the parameter α rapidly increases away from the wall and saturates to an almost constant value in the outer region. An appropriate scaling for α is also identified. As a result, the isotropic LANS-α equations can now be easily used in anisotropic channel flows with a universally damped α.

Kamran Mohseni
University of Colorado at Boulder

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