Near Wall Treatment of the Variable Resolution Partially Averaged Navier-Stokes Model POOYAN RAZI, Graduate Student, SHARATH GIRIMAJI, Professor — The objective of this work is to develop appropriate turbulence closures for bridging between different resolutions in the near-wall region. The development is made in the context of partially-averaged Navier-Stokes (PANS) method. Seamless transition from region of low-resolution near the wall to high-resolution away from the wall is controlled using the PANS filter parameter. The resolution variation introduces commutation effects which are modeled using additional terms in the turbulent kinetic energy equation. In addition, to conserve the total turbulent energy due to the interaction of unresolved and resolved flow fields, innovative strategies are evaluated for channel flow as well as flat plate boundary layer. This study identifies some important challenges regarding the numerical stability and appropriate implementation of the energy conservation principles. The preliminary results are shown to be encouraging.

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