Investigation of turbulent transport in hybrid PANS model DASIA REYES, SHARATH GIRIMAJI, Texas A&M University — Partially Averaged Navier-Stokes (PANS) turbulence method provides a closure model for any degree of velocity field filtering - ranging from completely resolved Direct Numerical Simulation (DNS) to completely averaged Reynolds Averaged Navier-Stokes (RANS) method. The physical closure investigation of PANS presented here is the validation of closure model chosen to describe the transport of the unresolved kinetic energy, k_u, and unresolved dissipation, ε_u, due to the resolved velocity fluctuations. The three models presented are the Zero Transport Model (ZTM), the Maximum Transport Model (MTM) and the Boundary Layer Transport Model (BLTM). In the ZTM it is assumed that the resolved velocity fluctuations do not contribute to the transport of the turbulent quantities. The MTM suggests that the transport of the unresolved scales of the turbulent quantities is proportional to the ratio of the unresolved to total viscosity. The BLTM is developed from the physics of the boundary layer. These models are tested against experimental results for flow past a circular cylinder.

Dasia Reyes
Texas A&M University