1145-76-2615 **Yong Yang*** (yyang@wtamu.edu), West Texas A&M University, WT Box 60787, Canyon, TX 79016. *Modal analyses on transitional boundary layer.*

A direct numerical simulation (DNS) by finite difference method is carried out to reveal the coherent structures in transitional boundary layer over a flat plate. A sixth order compact scheme is used in spatial discretization and a third order TVD Runge-Kutta scheme is adopted in time marching. The adiabatic and the non-slipping conditions are enforced at the wall boundary on the flat plate. On the far field and the outflow boundaries, the non-reflecting boundary conditions are applied. The Jacobian coordinate transformation is employed from physical domain to computational domain and the Message Passing Interface (MPI), together with domain decomposition, is utilized to accomplish the parallel computation. Based on the data-set obtained by DNS, the proper orthogonal decomposition (POD) and dynamic mode decomposition (DMD) are performed on a subdomain of the numerical data to extract dynamic information from snapshots of transitional flow. The extracted modes can be used to determine the most energetic structures and to describe the underlying physical mechanisms. By investigating the most principal mode of the flow field, the streamwise vortices are found to play significant roles in transitional boundary layer. (Received September 25, 2018)