Abstract Submitted
for the DFD20 Meeting of
The American Physical Society

Fluid dynamics of axisymmetric elongated bodies at high angle of attacks AL SHAHRIAR, KOUROSH SHOELE, Florida State University — In this study, flow over an axisymmetric body is investigated to determine the underlying physical phenomena responsible for the emergence of asymmetric flow structure at a high angle of incidence. Direct numerical simulations were conducted on curvilinear staggered grids with a sharp interface immersed boundary method. A pseudo-body-conformal grid is designed to provide higher resolution near the body. The cross-flow boundary layer and 3D vortical structures composed of two counter-rotating vortices are identified along the axisymmetric body like a cone and cone-cylinder configuration. The vortex strength and their interaction, instantaneous and average surface forces, shedding frequencies and angles were investigated in detail. It is discussed how the flow undergoes transition along the length of the body with the increase in the local Reynolds' number.?

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Date submitted: 10 Aug 2020 Electronic form version 1.4