Abstract Submitted
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Investigations of near wake in flow past rotating cylinders.[1] IGBAL MEHMEDAGIC, PASQUALE CARLUCCI, LIAM BUCKLEY, DONALD CARLUCCI, U. S. Army ARDEC, Picatinny Arsenal. NJ, SIVA THANGAM, Stevens Institute of Technology, Hoboken, NJ — Investigations of near wake region of the flow field past rotating cylinders whose axis is aligned with the flow are presented from a computational and experimental point of view. Cases covered include single cylinders and cylinders whose front or the rear segment spins while attached or separated. The time-averaged equations of motion along with the modeled form of transport equations for the turbulence kinetic energy and the scalar form of turbulence dissipation are solved by the use of finite-volume scheme. The energy spectrum is modified to incorporate the effects of swirl and rotation using a parametric characterization of the model coefficients. Experimental investigations from a subsonic wind tunnel cover a data for a range of spin rates and free stream flow conditions for flow past axially aligned cylinders with spinning segments. The results are discussed in the context of projectile design with such free spinning segments in smart munitions to provide effective control, stability and target guidance.

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