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Investigations of Flow past Spinning Cylinders[1] IGBAL MEHMEDAGIC, PASQUALE CARLUCCI, LIAM BUCKLEY, DONALD CARLUCCI, U. S. Army ARDEC, Picatinny Arsenal, NJ, ELIAS ALJALLIS, SIVA THANGAM, Stevens Institute of Technology, Hoboken, NJ — A subsonic wind tunnel is used to perform experiments on flow past spinning cylinders. The blunt cylinders are sting-mounted and oriented such that their axis of rotation is aligned with the mean flow. The experiments cover a Reynolds number range of up to 300000 and rotation numbers of up to 1.2 (based on cylinder diameter). The results for spinning cylinders with both rear-mounted and fore-mounted stings are presented. Computations are performed using a two-equation anisotropic turbulence model that is based on proper representation of the energy spectrum to capture rotation and curvature. The model performance is validated with benchmark experimental flows and implemented for analyzing the flow configuration used in the experimental study.

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