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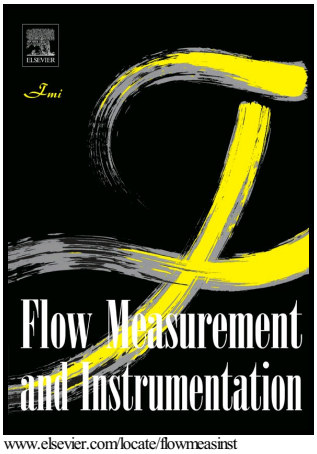

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Experimental Study of Drag Coefficient of Multistrand Wires Using Single Normal Hot-Wire Anemometer Probe

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Abstract

In a vertical wind tunnel, used for testing of aircraft and helicopters spin and simulation of skydiving, a protective net made of multistrand wires is installed below the flight chamber to prevent the fall of the test models or skydivers to the ground. The drag due to the protective net is significant, which results in pressure drop and subsequent increase in the required power to attain a desired speed in the tunnel. This paper presents the results of an experimental study of drag coefficient of multistrand wires, using (i) a single normal hot-wire anemometer probe (HWA), (ii) a pitot tube, which measures the total pressure downstream of the multistrand wires. Initially, the non-dimensional distance, *X/D*, at which HWA measurements can be used to determine the drag coefficient of the multistrand wires with acceptable accuracy, was obtained by considering flow velocity profile and turbulence intensity, downstream of a cylindrical rod of diameter *D*. The distance was determined to be $X/D > 30$, where *X* is the distance along the test section downstream of the cylindrical rod. Results of pitot tube and HWA measurements are in good agreement. These results show that at Reynolds number, $Re = 2000$, drag coefficient of the multistrand wires is greater than the cylindrical rod by approximately 16%. However, the difference in the drag coefficients