

Abstract Submitted  
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**A Double X-Array Hot-wire Probe for Simultaneous Three-Component Velocity Measurements** DOUGLAS NEAL, JOHN FOSS, Michigan State University, STÉPHANE MOREAU, Valeo Motors and Actuators — Four hot-wire sensors, mounted in a double X-array on a common probe shaft, can be used to obtain simultaneous values for three velocity components. Important turbulence quantities, such as the full Reynolds stress tensor, readily follow. The complexities of this probe along with the calibration and velocity component extractions from the four time series will be presented. Comparisons with other existing 3+ wire probes<sup>1</sup> will be discussed. Representative turbulence data collected using the double x-wire probe are presented for a low Mach number rotor-stator configuration. These phase-averaged measurements were collected directly downstream of the stator and provide important information about the design of these devices, along with insight into their complex flow field. The implications of these measurements to on-going CFD modeling efforts will be referenced.

<sup>1</sup>Wallace, J.M. and Foss, J.F., 1995, “The Measurement of Vorticity in Turbulent Flows”, *Ann. Rev. Fluid Mech.*, 27, p. 469-514

John Foss  
Michigan State University

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