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**Measurement of wall shear stress in a pulsatile pipe flow system using micro-pillar shear sensor (MPS3)** VRISHANK RAGHAV, CHRISTINE GARCIA, Georgia Institute of Technology, EBENEZER GNANAMANICKAM, Embry-Riddle Aeronautical University, AJIT YOGANATHAN, Georgia Institute of Technology, GT-EMBRY-RIDDLE COLLABORATION — The measurement of unsteady wall shear stress (WSS) in a pulsatile flow system is quite a challenge in experimental fluid mechanics. Recent developments in micro fabrication techniques have resulted in a novel measurement technique called the micro-pillar shear stress sensor (MPS3). It is a micro-pillar mounted on the surface of interest, which deflects an amount proportional to the shear stress it experiences. This technique has been widely used, validated and applied to measure turbulent WSS in several flow configurations. In this work, the MPS3 technique is used to measure WSS for a pulsatile fully developed pipe flow. The main objective here is to validate this technique for pulsatile pipe flow applications. For this purpose the WSS measurements obtained are compared with those obtained from analytical womersley solutions of the pulsatile flow system in the laminar flow regime. Statistical metrics will be used to better understand the measured WSS through the time period of the pulsatile flow.

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