Abstract Submitted
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Volumetric Velocity Measurements of Pulsating Flow through a Model Aneurysm[1] DANIEL TROOLIN, Fluid Mechanics Division, TSI Incorporated, DEVESH AMATYA, ELLEN LONGMIRE, Aerospace Engineering and Mechanics, University of Minnesota — Volumetric 3-component velocimetry (V3V) was used to examine the flow structure inside of a scaled-up transparent urethane model of a saccular aneurysm. The model was fabricated to match the geometry of an in vivo case. Index matching was used to minimize optical distortions caused by the curved walls of the model. The model and a surrounding visualization box were integrated into a custom-built pulse duplicator system with in-line flow meter and pressure transducers. The pulsing frequency and amplitude were controlled independently to generate two flow conditions each having a non-dimensional peak Reynolds (Re) and Womersley (Wo) Number: Re = 250, Wo = 10.4 and Re = 125, Wo = 7.4. Phase-locked and instantaneous measurements of the pulsatile flow upstream, downstream, and within the aneurysm reveal significant three-dimensional features including zones of separation, recirculation, impingement, and relative inactivity. Plots and movies will be shown, and a detailed discussion of the flow and various experimental considerations will be included.

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