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**Experimental Study of the Effect of a Skewed Inlet Flow Profile on Stenotic Flow Development** SEAN PETERSON, MICHAEL PLESNIAK, Purdue University — Blood flows through a constricted artery, or stenosis, are known to be sensitive to geometric and velocity perturbations. The effect of a skewed mean inlet velocity on the flow development distal to an axisymmetric stenosis (modeling a diseased carotid artery) driven by a physiological forcing waveform is studied. In the physiological environment, a skewed mean velocity profile (plus a secondary flow) can be produced, e.g. by vessel curvature. This study attempts to decouple the mean flow profile and the secondary flow in order to ascertain the impact of each disturbance individually. The skewed inlet profile is produced by a porous insert designed to replicate the mean flow profile downstream of a bend. LDV and PIV data are acquired to assess the impact of the skewed velocity profile on flow features. The skewed velocity profile was observed to promote earlier reattachment of the stenotic jet by deflecting it towards the wall sooner than in a baseline study. In a second experiment, the impact of secondary flow on the stenotic jet development is investigated by the introduction of a $180^\circ$ bend upstream of the stenosis. The mean flow profile is similar in character to that produced by the porous insert.

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