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The Role of Flow Reversals in Transition and Relaminarization of Pulsating Flows JOAN GOMEZ, The City College of New York, OLEG GOUSHCHA, Manhattan College, YIANNIS ANDREOPOULOS, The City College of New York — Pulsating flows, such as the flows in cardiovascular systems, exhibit a cyclic behavior of the axial velocity. They are of particular interest because at different times of the cycle the flow is laminar or turbulent, depending on the local Reynolds number. An experiment was setup to replicate the cyclic motion of the fluid in a clear, rigid tube. The flow was driven by a piston-motor assembly controlled by a computer. The motion of the piston was programmed to induce a forward-only cyclic motion of the mean flow by adjusting the amplitude of the longitudinal velocity pulsation in relation to the mean velocity. Time-Resolved Particle Image Velocimetry (TR-PIV) techniques were used to acquire velocity data on the plane of a CW laser illumination sheet. Flow reversal occurs first near the walls and the corresponding strong shearing induces transition to turbulence where the rest of the flow remains laminar. The behavior of reversed flow was analyzed under various Reynolds and Womersley numbers.

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