

Abstract Submitted
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Pulsating Flows in a Tube with Expandable Wall FRANK RAGUSO, OLEG GOUSHCHA, Manhattan College — A mean axial fluid flow inside a cardiovascular system has a periodic behavior driven by a heart. In one period, the flow through aorta is accelerated to a Reynolds number associated with turbulent flow and decelerated to nearly stagnant condition. The cyclic pressure in the aorta also exerts time-dependent forces on the walls of the cardiovascular system. Since walls are not rigid, they can expand under fluidic pressure. It is of interest to examine the effect of expandable walls on the flow regime transition. To achieve this, an experimental apparatus has been set up. The periodic mean axial flow inside the tubes is driven by a motor-controlled piston programmed to induce a periodic flow. A time-resolved particle image velocimetry method has been used to calculate the flow velocity field in two tubes: (1) a rigid tube and (2) a flexible tube with expandable walls. The velocity fields from two tubes were compared to identify any differences in flow transition mechanisms.

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