

Abstract Submitted
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Hemodynamics of physiological blood flow in the aorta with nonlinear anisotropic heart valve¹ FOTIS SOTIROPOULOS, College of Engineering and Applied Sciences, Stony Brook University, ANVAR GILMANOV, HENRYK STOLARSKI, Univ of Minn - Minneapolis — The hemodynamic blood flow in cardiovascular system is one of the most important factor, which causing several vascular diseases. We developed a new Curvilinear Immersed Boundary – Finite Element – Fluid Structure Interaction (CURVIB-FE-FSI) method to analyze hemodynamic of pulsatile blood flow in a real aorta with nonlinear anisotropic aortic valve at physiological conditions. Hyperelastic material model, which is more realistic for describing heart valve have been incorporated in the CURVIB-FE-FSI code to simulate interaction of aortic heart valve with pulsatile blood flow. Comparative studies of hemodynamics for linear and nonlinear models of heart valve show drastic differences in blood flow patterns and hence differences of stresses causing impact at leaflets and aortic wall.

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