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Fluid structure interaction (FSI) simulation of bileaflet mechanical heart valve in an anatomic aorta geometry LIANG GE, IMAN BORAZJANI, University of Minnesota, LAKSHMI DASI, Georgia Insitute of Technology, FOTIS SOTIROPOULOS, University of Minnesota, AJIT YOGANATHAN, Georgia Institute of Technology — FSI simulation of a medical quality BMHV implanted in the aortic position is studied. The valve is implanted in an anatomic non-compliant aorta geometry, which is reconstructed from MRI data acquired from a healthy volunteer. A physiological incoming flow waveform is specified at the inlet with the peak systolic Reynolds number equal to 6000. The flow solver is based on the CURVIB (curvilinear immersed boundary method) of Ge and Sotiropoulos, 2007 (JCP) and the FSI problem is solved with strong coupling partitioned approach. Direct numerical simulation is carried out on a grid system consisting of 10M grid nodes. The impact on hemodynamics by valve implantation is studied by considering different valve implantation angles. The calculated numerical results are analyzed in terms of leaflet kinematics and flow physics, and compared with data from our previous work, where the same valve is implanted in a simplified straight aorta geometry.

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