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3D Characterization of Transmitral Vortex using Defocusing Digital Particle Image Velocimetry AHMAD FALAHATPISHEH, BRANDON DUEITT, University of California Irvine, NIEMA PAHLEVAN, California Institute of Technology, ARASH KHERADVAR, University of California Irvine — In this study, we have experimentally characterized the 3D vortex passing through a physiologically relevant model of mitral valve using Defocusing Digital PIV (DDPIV). The valve model was made of soft silicone with diameter of $25mm$, similar to the adult mitral valve. The mitral model possesses a large anterior and a small posterior leaflet that results in asymmetric formation of transmitral vortex. A piston-cylinder mechanism drives the flow and travels to produce a range of L/D from 2 to 6. We have characterized the shape of the 3D vortex forming through the D-shaped orifice of a mitral valve using DDPIV technique. The evolution of the vortex has been illustrated for different stroke ratios.

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