

Abstract Submitted
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3D Reconstruction of the Vortex in a Human Right Ventricle Model using High Speed PIV ARASH KHERADVAR, AHMAD FALAHAT-PISHEH, University of California Irvine — This work aims to characterize the formation process and translation of the vortex, which forms along with the trans-tricuspid jet in a realistic model of a human right ventricle (RV). A clear model of the RV made of silicone rubber was carefully casted in real size from echocardiographic data of an adult human heart. The RV model was used in our heart pulsed-flow simulator at KLAB at UCI to perform experiments. Bioprosthetic heart valves in appropriate sizes were used at tricuspid and pulmonary positions. Multi-planar high-speed PIV was performed to capture and reconstruct the 3D flow field with a 1-millisecond time gap between each two velocity frames. λ_2 iso-surfaces were used to illustrate the evolution of vortex cores. The highly asymmetric shape of the RV chamber results in a complex 3D trans-tricuspid vortex that forms and translates toward right ventricular outflow tract, and finally departs RV from pulmonary valve. Through this study, -for the first time- the formation, evolution and pathway of the RV vortex have been characterized *in vitro*.

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