

Abstract Submitted
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A 3D velocimetry study of the flow through prosthetic heart valves¹ R. LEDESMA, R. ZENIT, G. PULOS, Inst. Inv. Materiales, Universidad Nacional Autonoma de Mexico, E. SANCHEZ, A. JUAREZ, Instituto Nacional de Cardiologia, Mexico — Blood damage commonly appears in medical valve prosthesis. It is a mayor concern for the designers and surgeons. It is well known that this damage and other complications result from the modified fluid dynamics through the replacement valve. To evaluate the performance of prosthetic heart valves, it is necessary to study the flow through them. To conduct this study , we have built a flow channel that emulates cardiac conditions and allows optical access such that a 3D-PIV velocimetry system could be used. The experiments are aimed to reconstruct the downstream structure of the flow through a mechanical and a bio-material tricuspid heart valve prosthesis. Preliminary results show that the observed coherent structures can be related with haemolysis and trombosis, illnesses commonly found in valve prosthesis recipients. The mean flow, the levels of strain rate and the turbulence intensity generated by the valves can also be directly related to blood damage. In general, bio-material made valves tend to reduce these complications.

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