

# **Towards 3D PIV measurements of a patient-specific arteriovenous fistula**

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## **ABSTRACT**

The arteriovenous fistula (AVF) is a vascular structure that is surgically created for kidney failure patients, to allow them to undergo haemodialysis efficiently. An AVF is susceptible to many vascular diseases which are associated with the disturbed nature of the flow in the unnatural geometry of the vessels. The current study examines the flow within the anastomosis and juxta-anastomotic regions of an AVF. To this end, a set of high-speed Stereoscopic Particle Image Velocimetry (PIV) measurements are conducted on a patient specific AVF model, with a patient specific cardiac flow profile. This paper details the experimental procedure and presents preliminary results, which reveal the presence of flow circulations in the juxta-anastomotic section at certain points in the cardiac cycle. Further, we observe the presence of unsteadiness in the venous segment that appears to commence at the anastomosis. These features correlate with the prevalence of vascular disease in the anastomotic and venous segment of the AVF.