Hemodynamic of a Coronary Artery: a PIV Measurement

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ABSTRACT

Understanding the flow features near the stenosis location inside a coronary artery is critical for identifying the possible mechanisms contributing to the disease progression. In this study, a Planar Particle Image Velocimetry (PIV) was employed to study the mean and instantaneous flow fields downstream of a semi-blocked artery model. Application of PIV for these types of problems is associated with some challenges such as the small region of interest, which is usually less than 1 cm and the pulsatile nature of the blood flow inside the arteries. The latter needs different timings between the images of a pair of PIV images with respect to the corresponding velocity during different phases of a cardiac cycle. By addressing all the challenges, PIV can be used as a powerful method to visualise the flow features inside the different arteries with the pulsatile in-flow regime.