

Abstract Submitted
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Analysis of Turbulent flow in early stages of atherosclerosis of coronary artery KIRAN BHAGANAGAR, University of Maine — During the early stages of atherosclerotic heart disease, fatty material accumulates in the coronary artery resulting in development of streaks of plaque and creating high levels of turbulence, and with significantly modified flow parameters. Diagnostic measures performed during this early stage may not show any evidence of coronary artery disease, because the lumen of the coronary artery has not decreased in caliber. These streaks do not obstruct the flow of blood but alter the flow characteristics, even at this preclinical stage. This talk presents the preliminary results for the analysis of turbulent flow characteristics for a range of atherosclerotic plaque configurations in the left main coronary artery. For this purpose a CAD/medical imaging based direct-simulation (DNS) tool has been developed. The Navier-stokes equations are solved in the vertical vorticity-velocity formulation. The plaque is introduced using immersed body technique. The geometric acquisition of the artery geometry and plaque morphology is obtained using CAD based commercial software.

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