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Numerical study of pulsatile flow in s-shaped vessels[1] KYUNG EUN LEE, BK21 School for Creative Engineering Design of Next Generation Mechanical & Aerospace Systems, Seoul National University, Seoul 151-744, Korea, JUNG YUL YOO, School of Mechanical & Aerospace Engineering, Seoul National University, Seoul 151-744, Korea — Blood flow in arteries is dominated by unsteady flow phenomena. The objective of this study is to better understand the effects of vascular geometry and the effect of pulsatility on flow in a double bend geometry which are chosen to loosely model a right coronary artery or femoral artery, neglecting branches. The three-dimensional numerical computations at the Reynolds numbers Re = 125 and 500 and Womersley numbers Wo = 4 and 8, were performed using imcompressible Navier Stokes solver which is based on spectral/hp element method. Pulsatility causes the Lean vortex pattern rather than Dean vortex pattern. Further, pulsatile flow through a double bend can induce more complicated secondary flows. In this numerical study we analyse the haemodynamics in terms of various mechanical factors (i.e., velocity, secondary flows, vorticity, coherent vortical structure and wall shear stress).

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