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Biofluid Dynamics in Cardiovascular System HANSOL CHUNG, Vassar College, SU JUNG YOO, Cornell University, RICHARD KYUNG, Choice Research & Technology — Biofluid dynamics is characterized by the study of fluids in biological systems. Common biofluid systems include blood flow in the cardiovascular system and airflow in the lungs. The mathematical modeling of blood flow through the complex geometry of a prosthetic heart valve is a difficult task. In such a problem the complex geometries of the valve must be modeled properly so that they can be studied numerically. The present analysis is performed on a disk-type prosthetic heart valve. The valve is assumed to be in the aortic position and observed the structure of the valve cage influence the flow field near an aortic valve. For the purpose of mathematical modeling, the laminar incompressible two-dimensional steady flow of a homogeneous Newtonian fluid with constant viscosity is assumed. The flow is considered during the greater part of systole when the valve is fully open. Convergent numerical solutions are obtained for Reynolds numbers of 30, 180, 900 and 4500. Stream function, horizontal velocity, vertical velocity and shear stress solutions are computed at every grid point.

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