

Jordan University of Science and Technology

Numerical Simulation of Bio-magnetic Fluid Downstream an Eccentric Stenotic Orifice

Authors: Saud Khashan, Yousef Haik

Abstract: Biomagnetic fluid dynamics is the study of the interaction of biological fluids with an applied steady magnetic field. The composition of the biological fluid is considered nonconducting; however, it has magnetic moment. The magnetic moment of the biological fluid can be enhanced by tagging superparamagnetic particles. Several biomedical applications recently developed utilize the magnetic labeling of cellular components. In this paper, the biomagnetic fluid downstream an eccentric stenotic orifice is considered. An external magnetic field is applied at different locations down stream the stenotic orifice. It is found that based on the location of the magnetic field, the reattachment point downstream the stenotic orifice changes; it is also found that the shear stress will be affected based on the magnetic field location. Major changes in the flow pattern have been also observed based on the magnetic field strength.