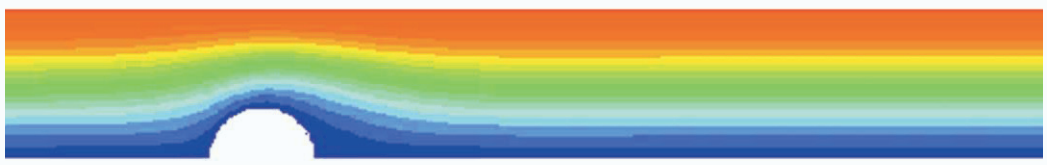
Journal of Visualization, Vol. 3, No. 4 (2001) 307

1. Simulation of Biomagnetic Fluid around Semicircular Thrombus

Haik, Y.[1] ***and Chen, C-J.***[1]

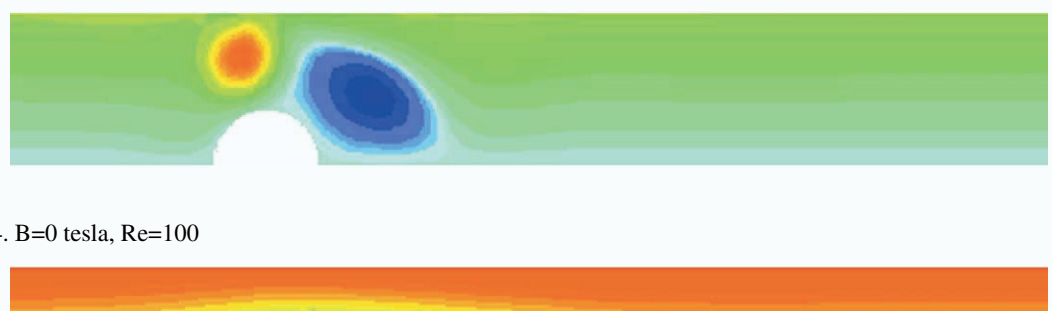
1) *FAMU-FSU College of Engineering, 2525 Pottsdamer Rd, Tallahassee, FL 32310, USA*

1. B=0 tesla, Re=10

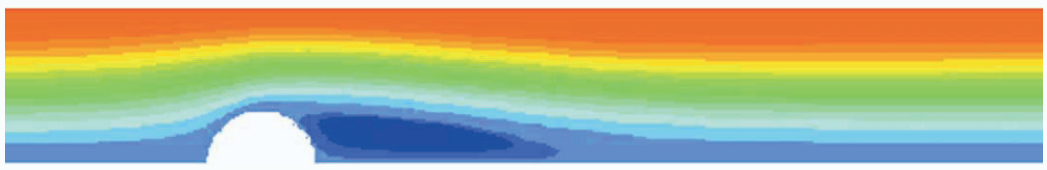


2. B=1.3 tesla, Re=10

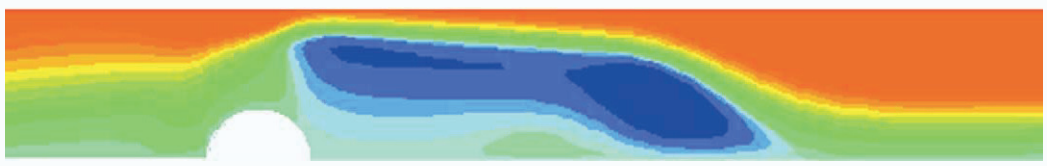
3. B=1.7 tesla, Re=10



4. B=0 tesla, Re=100



5. B=1.3 tesla, Re=100



The figures above show simulation of a biomagnetic fluid subjected to a magnetic field that is generated by two magnets; one magnet is located at the front edge of the semicircular thrombus while the other is directly adjacent to it and under the thrombus. The south pole of the first magnet is facing the thrombus while the north pole of the second magnet is facing the thrombus. The simulation is obtained by solving a modified Navier-Stocks' equations to accommodate for the magnetic force. As it is clear from the figures the placement of a magnetic field under the thrombus enhances the fluid circulation and thus increases the fluid friction. Also, as the magnetic field increases the circulation zones increase. This is because of the interaction between the inertia forces and the magnetic force of the biomagnetic fluid. The magnetic force is attracting the fluid toward the maximum field (near the thrombus) while the inertia force is pushing the fluid away from the thrombus.