

1106-92-85

**Ranadhir Roy\*** (rroy@utpa.edu), 1201 W University Drive, Edinburg, TX. *Unsteady Two-Phase Flow in a Catheterized Artery with Atherosclerosis.*

In this research we investigate the effect of oscillating axisymmetric blood flow on a catheterized artery in the presence of atherosclerosis, which is obtained from the available experimental data. The oscillatory (unsteady) blood flow in the arterial tube is formulated as a two-phase model composing a suspension of erythrocytes (red cells) in plasma. The coupled differential equations for both fluid (plasma) and particles (red cells) are solved by using analytical and computational methods. The important quantities such as plasma speed, velocity of red cells, blood pressure force, impedance (blood flow resistance) and the wall shear stress are computed for different values of the catheter size and hematocrit due to the red cells. We calculate dependence of these quantities on the temporal and spatial variable as well as on the frequency of the flow oscillation and the main parameters of the flow system. We find, in particular, that the higher value of the frequency, larger catheter size, and higher values of hematocrit can lead to higher values of axial velocity, the impedance and the wall shear stress in the stenosis zone. (Received July 07, 2014)