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Ranadhir Roy* (rroy@utpa.edu), 1201 West University Drive, Edinburg, TX 78539, and
Daniel N Riahi (rroy@utpa.edu), 1201 University Drive, Edinburg, TX 78539. *Unsteady blood flow in an artery with an overlapping stenosis.*

We consider the problem of unsteady blood flow in an artery and in the presence of an overlapping symmetric stenosis. The blood flow in the arterial tube is assumed to be a suspension of red cells in plasma. The present formulation makes use of the variable fluid viscosity modeling that takes into account the amount of the red cells in the blood fluid flow system. Using both analytical and computational methods, we determine the expressions for various quantities such as the leading order flow velocity, pressure gradient, impedance and shear stress at the throats and at the critical height, and we calculate dependence of these quantities on the temporal and spatial variables 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 can lead to higher values of the magnitude for the quantities such as the axial velocity, the impedance and the wall shear stress in the stenosis zone particularly if the stenosis is less mild. Key Words: arterial flow, blood flow, impedance, unsteady flow, shear stress. (Received July 25, 2011)