

# Mathematical Study and Simulation on Stenosed Carotid Arteries with the Help of a Two-phase Blood Flow Power Law Model

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## ABSTRACT

Present study is focused on a medical problem called stenosed carotid artery. Proposed problem is formulated with the help of a two-phase blood flow power law model. Non-Newtonian nature of blood is considered. Physical quantities have been expressed into tensorial form. Analytical and numerical methods are used to solve equations undertaken boundary conditions. Effects of various parameters on blood flow like stenosis size, flow flux, resistance, haematocrit, pressure drop etc. have been studied and shown through various graphs. Impact of parameter  $k$  that ensures the nature of fluid, has been obtained with respect to different flow characters. A relation obtained between pressure drop and haematocrit which is helpful to predict fluctuation in blood flow during stenosis. A comparative study is also made with the other earlier theoretical models.

**Keywords:** non-Newtonian blood flow, stenosed vessel, power law, two phase blood flow model.

