Series Solutions for the Peristaltic Flow of a Tangent Hyperbolic Fluid in a Uniform Inclined Tube

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In the present investigation we have studied a tangent hyperbolic fluid in a uniform inclined tube. The governing equations are simplified using long wavelength and low Reynold number approximations. The solutions of the problem in simplified form are calculated with two methods namely (i) the perturbation method and (ii) the homotopy analysis method. The comparison of the solutions show a very good agreement between the two results. At the end of the article the expressions of the pressure rise and the frictional force are calculated with the help of numerical integration. The graphical results are presented to show the physical behaviour of Weissenberg number *We*, amplitude ratio ϕ, and tangent hyperbolic power law index *n*.

Key words: Series Solutions; Peristaltic Flow; Tangent Hyperbolic Fluid; Uniform Tube.