Long Wavelength Flow Analysis in a Curved Channel

Nasir Ali[a], Muhammad Sajid[b], and Tasawar Hayat[c]

[a] Department of Mathematics, International Islamic University, Islamabad, Pakistan
[b] Theoretical Plasma Physics Division, PINSTECH, P. O. Nilore, Islamabad, Pakistan
[c] Department of Mathematics, Quaid-i-Azam University, Islamabad, Pakistan

Reprint requests to N. A.; E-mail: nasirali_qau@yahoo.com

Z. Naturforsch. **65a,** 191 – 196 (2010); received March 9, 2009 / revised July 21, 2009

This study is concerned with the peristaltic flow of a viscous fluid in a curved channel. Mathematically the problem is governed by two partial differential equations. Closed form solutions of the stream function, axial velocity, and pressure gradient are developed under long wavelength and low Reynolds number assumptions. The influence of curvature is analyzed on various flow quantities of interest.

Key words: Curved Channel; Peristalsis; Viscous Fluid; Modelling; Wave Frame.