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## PERISTALTIC TRANSPORT OF POWER LAW FLUID IN FINITE LENGTH VESSELS

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## Abstract

This paper studies the peristaltic flow of power law fluid through a channel of finite length under the assumption of long wavelength and low Reynolds number. Expressions for the axial velocity, transverse velocity, pressure gradient, and volume flow rate are obtained. The wall equation of channel is assumed to be sinusoidal wave. The effects of fluid behavior index on pressure distribution, local wall shear stress, mechanical efficiency and reflux limit are discussed. Pressure distribution pattern is qualitatively similar, but quantitatively different for different fluid behavior index. It is revealed that pressure, local wall shear stress and mechanical efficiency are maximum for pseudoplastic fluid and minimum for dilatant fluid. Maximum averaged flow rate is also increasing with fluid behavior index. Reflux limit is identical in all the cases.

Key Words: Peristalsis, Finite length channel, Power law fluid, Mechanical efficiency, Reflux.