

## عنوان مقاله:

Study of the non-Newtonian behaviour of Reiner Rivlin relative to power law in arterial stenosis

## محل انتشار:

مجله روشهای محاسباتی برای معادلات دیفرانسیل، دوره 10، شماره 4 (سال: 1401)

تعداد صفحات اصل مقاله: 14

## نویسندگان:

Nibedita Dash - *Department of Mathematics, School of Physical Sciences, Doon University, Dehradun, India*

Sarita Singh - *Department of Mathematics, School of Physical Sciences, Doon University, Dehradun, India*

## خلاصه مقاله:

The present paper develops the solution of steady axi-symmetric Navier-Stokes conservation equations incorporating Reiner Rivlin stress and strain rate relation that represents generalized non-Newtonian fluid. Perturbation solution is obtained to determine the flow field for axially symmetric stenosed artery. The flow field obtained from the Perturbation solution is compared with the exact analytical solution. In perturbation solution, cross viscosity that represents non Newtonian characteristics is considered a perturbation parameter, and the result obtained is observed to be dependent on the perturbation parameter. At smaller values of cross viscosity, the perturbation result is significantly closer to the analytical solution. But, as the values of cross viscosity increase, the perturbation results show a wider deviation from analytical results. Further, in this paper, the results of Reiner Rivlin are compared with the results obtained from the Power Law stress and strain rate relation. Such comparison of results of Reiner Rivlin with Power law is utilized to study the flow characteristics of blood. The flow profile in the case of Reiner Rivlin is observed to be significantly closer to that of Power law. The study infers that Reiner Rivlin's constitutive relation is fairly suitable in simulating blood flow in arterial stenosis.

## کلمات کلیدی:

Stenosis, Reiner-Rivlin Fluid, Viscosity, Cross viscosity, Perturbation

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1595600>

