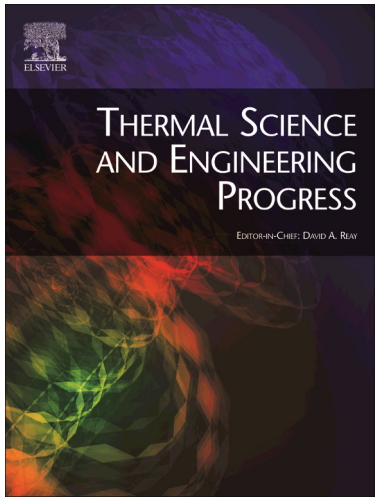

Effects of nanoparticles (Cu (Copper), Silver (Ag)) and slip on unsteady blood flow through a curved stenosed channel with aneurysm

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Effects of nanoparticles (Cu (Copper), Silver (Ag)) and slip on unsteady blood flow through a curved stenosed channel with aneurysm

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Abstract: The present article is concerned with the slip effects on unsteady pulsatile blood flow through a curved channel containing nano-particles in the presence of stenosis and aneurysm. The nano-particles momentum and thermal energy equations are developed using curvilinear co-ordinates. The suitable slip boundary conditions are imposed at the channel walls. Employing mild stenotic condition, the governing differential equations are solved numerically using a robust explicit finite difference scheme. The effects of slip on various hemo-dynamical variables such as velocity, flow rate, wall shear stress and resistance to flow are shown through plots. The effects of nano-scale particles and thermo fluid parameters on flow and heat transfer characteristics of blood have been discussed in detail in this article. The flow patterns are also shown through plotting streamlines. Calculated results reveal that velocity, flow rate and shear stress increase while resistance to flow decreases with greater volume fraction of nanoparticles. The current work has many applications in the field of nano-pharmacological transport phenomena, a new and exciting area of modern medical fluid dynamics which is used to integrate the coupled diffusion and nano-scale drug delivery mechanisms.

Keywords: *Slip effects; unsteady; Aneurism; Blood; Nanoparticles (Cu, Silver); Explicit Finite differences; Grashof number; pharmaco-dynamics.*

Nomenclature

A_0	Amplitude of the pressure gradient
A_1	Amplitude of the pulsatile component
B_1	Dimensionless pulsatile constant
e	Ratio of the systolic to diastolic pressure
e_0	Radius of normal artery
Gr	Grashof number
f_p	Heart pulse frequency