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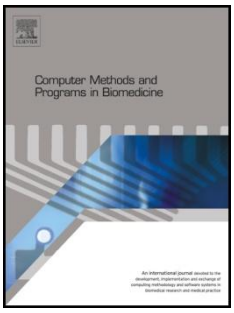

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Study of heat transfer on physiological driven movement with CNT nanofluids and variable viscosity

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Research Highlights:

- Ongoing interest in CNT nanofluids and materials in biotechnology, energy and environment, microelectronics, composite materials etc.
- The current investigation is carried out to analyze the effect of variable viscosity and thermal conductivity of CNT nanofluids driven by cilia induced movement through a circular tube.
- The problem is formulated in the form of non linear partial differential equations, which are simplified by using the dimensional analysis to avoid the complicacy of dimensional homogeneity.
- Lubrication theory is employed to linearize the governing equations and which are also physically appropriate for cilia movement.
- Analytical solutions for velocity, temperature and pressure gradient and stream function are obtained.
- The analytical results are numerically simulated by using the Mathematica Software and plotted the graphs for velocity profile, temperature profile, pressure gradient and stream lines to better discussion and visualization.
- This model is applicable in physiological transport phenomena to explore the nanotechnology in engineering the artificial cilia and ciliated tube/pipe

Abstract:

Background and Objectives: Ongoing interest in CNT nanofluids and materials in biotechnology, energy and environment, microelectronics, composite materials etc., the current investigation is carried out to analyze the effects of variable viscosity and thermal conductivity