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Khan, M.N., Khan, W.A., Tlili, I.

Forced convection of nanofluid flow across horizontal elliptical cylinder with constant heat flux boundary condition
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Abstract
In this study, steady forced convection of water-based nanofluids past an elliptical cylinder is investigated numerically. To enhance heat transfer, copper (Cu) and (Al2 O3) nanoparticles were included in the water. The governing equations are converted into a system of non-similar differential equations by using suitable transformations. These transformed equations are then solved numerically using Runge-Kutta-Fehlberg method of seventh order (RKF7) coupled with a shooting method. Numerical results are obtained for the dimensionless velocity, temperature, and concentration as well as the skin-friction, and Nusselt numbers for different values of axis ratio and solid volume fraction of nanoparticles. It is shown that the skin friction and local Nusselt number increase with solid volume fraction of nanoparticles and axis ratios while they decrease with respect to the location ε. © 2019 by American Scientific Publishers. All rights reserved.

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