

DRBEM SOLUTION OF NATURAL CONVECTION FLOW OF
WATER-BASED NANOFLUIDS IN AN INCLINED ANGLE

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Abstract

In this study, heat transfer and fluid flow due to buoyancy forces in a partially heated and an inclined square enclosure is carried out using two types of nanoparticles (Al_2O_3 and Cu). Stream function-vorticity form of the governing equations are solved by using dual reciprocity boundary element method (DRBEM) with the fundamental solution of modified Helmholtz equation. By using the form of modified Helmholtz equation for the governing equations, the need of another time integration scheme is eliminated. Results are given in terms of streamlines, isotherms and vorticity contours for inclined angle from 0° to 90° , Rayleigh number values between 10^3 and 10^6 , and volume fraction of nanoparticles changing from 0 to 0.2. Also, the length of the heater is taken 0.25, 0.5 and 1.0 which is placed at the center of the left wall. The results are show that the type of the nanoparticles, the length of the heat source and the inclined angle affect the heat transfer of the fluid.

Keywords: DRBEM, Natural Convection, Nanofluid, Inclined angle.

References

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