

## Documents

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**Conjugate heat transfer of Al<sub>2</sub>O<sub>3</sub>–water nanofluid in a square cavity heated by a triangular thick wall using Buongiorno's two-phase model**  
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### Abstract

The present study investigates the conjugate heat transfer in a square cavity heated by a triangular solid and saturated with Al<sub>2</sub>O<sub>3</sub>–water nanofluid. Two-phase Buongiorno's model is used for modeling the nanofluid heat transfer. The finite element method is used for numerical solution of the dimensionless governing equations subject to the boundary conditions. Comparisons of the proposed method with previously published experimental and numerical works show a good agreement. The effects of some parameters such as the Rayleigh number, thermal conductivity ratio, dimensionless triangular wall thickness and nanofluid volume fraction on heat transfer and nanoparticle distributions are completely studied and discussed. The results show clockwise rotations for streamlines and nanoparticle migration. Also the Nusselt number increases with the nanofluid volume fraction. A continuous reduction is seen for the mean Nusselt number by increasing the dimensionless triangular wall thickness for all the considered values of the Rayleigh number. © 2018, Akadémiai Kiadó, Budapest, Hungary.

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