# Accepted Manuscript


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PII: S0997-7546(16)30335-1
DOI: http://dx.doi.org/10.1016/j.euromechflu.2017.04.007
Reference: EJMFLU 3164

To appear in: *European Journal of Mechanics B/Fluids*

Received date: 14 August 2016
Revised date: 11 April 2017
Accepted date: 18 April 2017

Please cite this article as: M. Turkyilmazoglu, Condensation of laminar film over curved vertical walls using single and two-phase nanofluid models, *European Journal of Mechanics B/Fluids* (2017), http://dx.doi.org/10.1016/j.euromechflu.2017.04.007

# Condensation of laminar film over curved vertical walls using single and two-phase nanofluid models

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11 April 2017

**Abstract**

Recently, an analytical solution was derived for the governing equations of condensate laminar film from stationary vapours on curved vertical walls of convex/concave shape [1]. The present research paper develops a theory covering the impacts of different nanofluids and derives further closed-form solutions concerning the hydrodynamic and thermal transport through the condensate film over curved walls when the single phase and two-phase models of nanofluids are taken into account. From both approaches, exact expressions are obtained for the velocity and temperature fields as well as the shear stress, thickness and Nusselt number of the film influenced by the presence of nanoparticles of frequently used nanofluids in the literature. It is found that heat transfer is enhanced, even more in the two-phase model case in the presence of nanoparticles. The concentration of $Ag$ nanoparticles favors the best rate of heat transfer among the considered nanofluids.

**Keywords** Curved walls, Film condensation, Nanofluids, Heat transfer, Exact solution.

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