

Abstract Submitted
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Nanofluid heat transfer enhancement in a developing laminar shear flow J.T.C. LIU, School of Engineering, Brown University — The continuum conservation equations for nanofluid flow (J. Buongiorno 2006 *J. Heat Transfer* 128, 240-50) is applied to a two-dimensional channel entrance region, subjected to a Rayleigh approximation for the nonlinear advection. A perturbation expansion for very small nano-particle volume concentration is used to further simplify the system. The zeroth order similarity solution furnishes the input for the first order problem for nanofluid momentum, volume concentration and heat transport. The latter is cast into a form to show the effect of volume concentration as an effective heat source, thus promoting enhanced heat transfer. Similar solutions for the sequentially solvable first order system is sought to quantitatively describe the dynamics and thermodynamics of nanofluid flow in this much simplified shear flow problem.

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