Latest Development On Computational Approaches For Nanofluid Flow Modeling: Navier–Stokes Based Multiphase Models

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ABSTRACT
Nanofluids have gained significant attention in recent years due their great potential for heat transfer enhancement. The heat transfer of nanofluids can be numerically studied using a single-phase or two-phase approaches. The first assumes that the fluid phase and nanoparticles are in thermal equilibrium and move with the same velocity, while the second requires more computational effort but provides the possibility of understanding the behavior of both fluid phase and solid particles in the heat transfer mechanism. This paper reviews various computational approaches to predict fluid flow and heat transfer characteristics of nanofluids. The characteristics of single-phase and two-phase (volume of fluid, mixture, Eulerian–Lagrangian and Eulerian–Eulerian) approaches have been analyzed and discussed systematically. Latest development and recent researches related to the computational nanofluids are also given.