

Abstract Submitted
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Effect of variable magnetic field on nanofluid flow and heat transfer MOHAMMADKAZEM SADOUGHI, Department of Mechanical Engineering, Iowa State University of Science and Technology, Ames, IA 50011, United States, MOHSEN SHEIKHOLESLAMI, Department of Mechanical Engineering, Babol University of Technology, Babol, Islamic Republic of Iran, HAMED SHARIATMADAR, School of Mechanical Engineering, College of Engineering, University of Tehran, Tehran 1439955961, Iran — In this paper, Control Volume based Finite Element Method is applied to simulate nanofluid flow and heat transfer in presence of variable magnetic field. Magnetohydrodynamic (MHD) equations are coupled with the energy equation due to the heat transfer by means of the Boussinesq approximation. Then, the 2D non-dimensional full MHD equations in terms of stream function, temperature, magnetic field and vorticity are solved by using CVFEM. The calculations were performed for different governing parameters namely; the Rayleigh number, nanoparticle volume fraction and Hartmann number arising from MHD. Results show that Nusselt number has direct relationship with Rayleigh number, nanoparticle volume fraction while it has reverse relationship with Hartmann number. Also it can be found that enhancement in heat

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