

Springer

Comp. Appl. Math. (2015) 34:293-307

DOI 10.1007/s40314-014-0117-z

Effects of Couple Stresses on Entropy Generation Rate in a Porous Channel with Convective Heating

Samuel O. Adesanya, Oluwole D. Makinde

Abstract: This paper investigates the effect of couple stresses on the entropy generation rate of an incompressible viscous fluid through a porous channel with convective heating at the walls. Semi-analytical solutions of the dimensionless momentum and energy equations are obtained using the rapidly convergent modified Adomian decomposition method. The approximate solutions are used to compute the entropy generation numbers, irreversibility distribution ratio and the Bejan number in the flow field. The effects of various flow parameters on the velocity and temperature are discussed and shown graphically

Keywords: Couple stresses, Entropy generation, Convective heating, Porous channel, mADM