International J. of Engg. Research & Indu. Appls. (IJERIA). ISSN 0974-1518, Vol.2, No.II (2009), pp 259-268

MODELLING OF BOUNDARY LAYER EQUATION IN AXI- SYMMETRIC JET MIXING OF INCOMPRESSIBLE FLOW IN CYLINDRICAL POLAR COORDINATES ALONG WITH VOLUME FRACTION EFFECT

D. K. DASH AND B. K. RATH

Abstract

Modelling of boundary layer equation in axi symmetric jet mixing incompressible flow in cylindrical polar coordinates has been studied. The effect of finite volume fraction of suspended particulate matter on axially symmetrical jet mixing of incompressible dusty fluid has been considered. Assuming the velocity and temperature in the jet to differ only slightly from that of the surrounding stream, a perturbation method has been employed to linearize the basic equations .the linearized boundary layer equations have been solved by using Hankel transform technique. Numerical computations have been made to discuss he velocity profiles of both fluid and particle phase. It is observed that the magnitude of perturbation velocity of both fluid and particle phase is to reduce significantly.

Keywords: Particulate suspension, Boundary layer characteristics, volume fraction, diffusion. Incompressible fluid.