

Abstract

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Lie-group method of solution for MHD viscous flow over stretching sheet

We apply Lie-group method for determining symmetry reductions for the MHD boundary-layer equations. The induced magnetic field is neglected for small magnetic Reynolds number in the presence of a uniform applied magnetic field and the viscous fluid is assumed to be electrically conducting. Liegroup method starts out with a general infinitesimal group of transformations under which the given partial differential equations are invariant. The determining equations are a set of linear differential equations, the solution of which gives the transformation function the infinitesimals of the dependent and independent variables. After the group has been determined, a solution to the given partial differential equations may be found from the invariant surface condition such that its solution leads to similarity variables that reduce the number of independent variables of the system. The effect of the magnetic parameter M and the parameter γ which is dependent on the index n of the magnetic field, on the horizontal and vertical velocities and the wall shear stress (skin friction), have been studied.