

MHD RUN UP FLOW OF A MAXWELL FLUID THROUGH POROUS MEDIUM IN A PARALLEL PLATE CHANNEL

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Abstract

We consider the unsteady magneto hydro dynamic flow of an incompressible Maxwell fluid in a parallel plate channel, initially induced by a constant pressure gradient. The pressure gradient is suddenly with drawn while the plates are impulsively started simultaneously. The arising flow is referred to as run up flow. The unsteady governing equations are solved as initial value problem using Laplace transform technique. The expressions for velocity, shear stresses on both plates and discharge are obtained. The behaviour of the velocity, shear stresses and mass flux has been discussed in detail with respect to variations in different governing flow parameters and is presented through graphs.

Keywords : Run-up flow, Maxwell's fluid, Laplace transforms, MHD flows and parallel plate channels.