

RAYLEIGH-TAYLOR INSTABILITY OF COUPLE STRESS FLUID THROUGH POROUS MEDIA IN A FLUID LAYER OF FINITE THICKNESS

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ABSTRACT

Linear Rayleigh-Taylor instability of couple stress fluid layer of finite thickness through porous media has been studied in the creeping flow limit using normal modes. It is shown that the porous parameter, couple stress parameter have reducing effect on the growth rate whereas layer thickness has increasing effect on the growth rate. Shape of the dispersion curve is controlled only by the ratio of surface tension to pressure gradient.

KEY WORDS: Growth rate; Couple stress parameter; Porous parameter; Dispersion relation