Linear stability analysis of two phase stratified one dimensional Poiseuille flow with surfactant at the interface, in a channel ASHUTOSH SINGH, SUBRAMANIAM PUSHPAVANAM, IIT Madras, Chennai,India 600036, PROF. PUSHPAVANAM RESEARCH LEAGUE TEAM — Linear stability analysis of one dimensional Poiseuille flow of two superposed fluids with surfactant at the interface is considered in a channel . Three dimensional disturbance is considered for arriving at the Orr-Sommerfeld equations for both the fluids. The mathematical formulation yields a generalized eigen value problem Ax=cBx, which is solved by numerically by spectral collocation technique. Gaussian elimination is employed to recast the eigen value problem as A'x'=cB'x' in order to get rid of the zero rows in B as explained by Boomkamp. Dispersion curves are plotted for different Reynolds numbers in order to distinguish between interfacial and shear modes for both the cases ;with and without surfactant at the interface. The role of surfactant in stabilization is investigated and the results for pure interface case are compared with that of Yiantsios and Higgins.

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