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**Control strategy for a double-diffusive two-fluid channel flow: A stability analysis** SUKHENDU GHOSH, R. USHA, KIRTI SAHU, Indian Institute of Technology Madras — The effect of velocity slip (symmetric and asymmetric) at the walls on the linear stability characteristics of miscible two-fluid channel flow is considered in the presence of double diffusive (DD) phenomenon. The channel walls are made of same material or different materials; this suggests symmetric or asymmetric slip condition at the walls. The fluids are miscible, and consist of two solute species having different rate of diffusion. Both the fluids are assumed to be of the same density, but varying viscosity, which depends on the concentration of the solute species. This flow system is more unstable than the corresponding single component (SC) flow as well as unstratified flow, due to the presence of double-diffusive (DD) effect. When the mixed region of the fluids moves towards the channel walls a new unstable mode (namely the DD mode) arises at low Reynolds numbers. The slip parameter has nonmonotonic effect on the stability characteristics in this system. The trend of slip effect is influenced by other flow parameters. The effects of wall slip on the flow stability is weak or strong depending on the slip condition, only for the upper wall or only for the lower layer or for both the walls. Increasing the value of the slip parameter delays the first occurrence of the DD-mode.

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