

# Thermocapillary Instability of Three Immiscible Phases Flowing Through a Channel

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Previous studies considering thermocapillary convection in symmetrical multilayer systems assume the interface is rigid (non-deflecting) and the fluids are stationary. This paper re-examines the Marangoni-Bénard instability for a three-layer system with deflecting interfaces undergoing planar Poiseuille flow. Linear stability analysis shows that at small and large wave numbers a deflecting interface has a different linear stability than a non-deflecting interface. At intermediate values of wave number both cases have the same stability point. Furthermore, considering a deflecting interface reveals that a base planar Poiseuille flow affects the linear stability of the system. The dependence of the linear stability analysis on the viscosity ratio and depth ratio are also presented.