69c Stability of Liquid Bridges Subject to Shearing

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The volume of liquid held between two solid disks is called a liquid bridge. In the last ten years, a significant number of theoretical and experimental papers dealing with the behavior of liquid bridges in a low gravity environment have been published. Equilibrium shapes and stability limits of liquid bridges have been investigated. Such studies are interesting because of the application in the float-zone crystal growth process. In this technique a molten zone is created between a polycrystalline feed rod and a monocrystalline seed rod. To control the escape of volatile constituents, encapsulants are added and the float zone is concentrically surrounded by an immiscible liquid. The thermocapillary convection in the presence of an encapsulant generates a shear flow and this shear flow has an effect on the bridge stability. Our interest lies in the stability of the zone in the presence of shear flow. In this study, the liquid bridge is surrounded by another liquid of same density, which provides a gravity-free system. The effect of shearing the outer wall on the stability of the liquid bridge is investigated.