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Marangoni forces in interfacial dilatational rheology GWYNN ELFRING, GARY LEAL, TODD SQUIRES, University of California Santa Barbara — Many methods for measuring the mechanical properties of fluid interfaces involve generating a flow at the interface with both dilatation and shear, such as by translating a probe through a fluid interface. We examine here the force on a translating probe at an interface laden with a soluble surfactant, that exhibits Newtonian interfacial rheology. We assume that the interface is neither incompressible nor equilibrated. We look at the effects on the force measured by a probe due to small deviations in the concentration field which result from the dilatational flows induced by the probe. In particular we discuss the coupling of concentration relaxation and surface viscosity on Marangoni forces generated by the interfacial flows.

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