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Technique for Measurement of Inter-Phase Line Tension in Langmuir Films LU ZOU, Kent State University, JACOB M. PUGH, Harvey Mudd College, ELIZABETH K. MANN, Kent State University, ANDREW J. BERNOFF, Harvey Mudd College, JAMES C. ALEXANDER, J. ADIN MANN, JR., Case Western Reserve University — Line tension, the free energy per unit length associated with the line boundary, controls properties such as size and shape of surface domains. It plays an important role in two-dimensional surface phases. It has been extremely difficult to measure this parameter to better than $\pm 20\%$. We made a model of the fluid dynamics governing the relaxation of phase domains in Langmuir Films and implemented a numerical solution. Experimentally, a four-roll mill provided symmetric shear forces about a central stagnation point on the 8CB multilayers sitting at air/water interface. 8CB domains were stretched into bola shape and then performed relaxations. We compared relaxations observed with a Brewster-angle microscope to the simulated ones and deduced the line tension driving the relaxation from this comparison. In this way, the relative standard deviation could be remarkably reduced to $< 5\%$.

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