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The relaxation of tweezed giant unilamellar vesicles WOLFGANG LOSERT, Department of Physics, Institute for Physical Science and Technology, University of Maryland, College Park, USA, HERNAN ZHOU, Physics Department, Eindhoven University of Technology, BEATRIZ BURROLA GABILONDO, Department of Physics, Institute for Physical Science and Technology, University of Maryland, College Park, USA, WILLEM VAN DE WATER, Physics Department, Eindhoven University of Technology — We study the shape relaxation of spherical giant unilamellar vesicles which have been deformed far from equilibrium into ellipsoids using optical tweezers. The relaxation back to a sphere is determined by elastic constants of the vesicles, and their excess area, as well as by low Reynolds number fluid flow. The properties of each vesicle are learned from observing its shape fluctuations in thermal equilibrium. We will critically evaluate the spectroscopic techniques used to find those properties. The relaxation time of the stretched vesicles could be compared favorably to a simple formula which encompasses the joint effect of membrane rigidity and fluid flow. The time constant of the stretched vesicle is slower than that of its thermal fluctuations, which agrees with a recent theory, however, it is still one order of magnitude faster than predicted.

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