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Forced shape deformations of interfaces and biopolymer networks WOLFGANG LOSERT, ANDREW POMERANCE, CORY POOLE, ERIN RERICHA, University of Maryland — What sets the characteristic length and timescale of shape deformations of motile cells? To investigate possible contributions to these scales, we investigate shape deformations of biopolymer networks and lipid bilayers, two key components of motile cells. Controlled deformations are generated with holographic optical tweezers and detected optically. We observe that for small deformation lengths of up to 4 microns (for cage sizes less than one micron) and short time deformations of order seconds, actin networks respond mostly elastically. We see evidence of coupling between two nearby deformation fields in an actin network. Relaxations of directly forced giant unilamellar vesicles reveal that -during free relaxation- apparent membrane stresses remain localized on micron scales.

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