Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Fluctuations spectrum of passive and active giant vesicles measured by contour analysis. JACQUES PÉCRÉAUX, HANS-GÜNTHER DÖBEREINER, Biological Sciences, Columbia University, New York, NY 10027, USA, JACQUES PROST, JEAN-FRANÇOIS JOANNY, PATRICIA BASSEREAU, Physico-Chimie Curie, 11 rue Curie, 75231 Paris cedex 5, France — We have developed a new method of contour analysis using phase contrast microscopy on giant vesicles [1]. Our set-up allows an accurate detection at video rate, and a direct comparison with theory in a planar geometry. We have been able to measure directly fluctuations spectra. For pure lipid vesicles, we measure bending rigidities corresponding to those of the literature. Our technique has also been extended to non-equilibrium membranes. We have set up a protocol to prepare giant vesicles containing bacteriorhodopsine[2], a light- activated protons pump. When the protein is pumping this system is a simple model of active membrane. We have measured the fluctuation spectra of these active liposomes. As a first analysis, our results cannot be explained by actual active membranes theory [4] and are not in agreement with micropipette experiments [3-4].

[1] J.Pécréaux et al. (2004) Eur. Phys. J. E 13(3): 277-290.
[2] P. Girard, J.Pécréaux et al (2004), Biophys. J. 87: 419-429.
[3] J.-B. Manneville et al. (1999), Phys. Rev. Lett. 82: 4356-4359.
[4] J.-B. Manneville et al. (2001), Phys. Rev. E 64(2): 021908.

Jacques Pécréaux
Physico-Chimie Curie, Section Recherche,
Institut Curie, 11 rue Pierre et Marie Curie, 75231
Paris cedex 5, France

Date submitted: 20 Mar 2013 Electronic form version 1.4