Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Analysis of membrane thickness fluctuations as a local mode ROBERT BRADBURY, MICHIHIRO NAGAO, Indiana Univ - Bloomington — The mechanical properties of surfactant membranes have been a focus of work to further understand mechanisms of self-assembly. Indeed, the dynamics of the membranes are controlled by these properties. Neutron spin echo spectroscopy (NSE) has been used to probe membrane undulation and thickness fluctuation dynamics since the technique is sensitive to the length and time scale of these membranes. While quantitative treatment of the undulation fluctuations has been well served by application of a model devised by Zilman and Granek, an asymmetric bilayer model proposed by Bingham, Smye and Olmsted, is known to describe membrane thickness fluctuations in solution. This model predicts peristaltic fluctuations to exist as a local mode when the fluctuation wavelengths are relatively short. Here, we use this concept to analyze the NSE data in an oil-swollen surfactant bilayer. The results are compared with a currently used empirical method and a comparison of the calculated parameters displays a strong correlation between the present and the empirical methods for the values of thickness fluctuation relaxation rate and amplitude.

Robert Bradbury
Indiana Univ - Bloomington

Date submitted: 11 Nov 2016 Electronic form version 1.4