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Damping of the thermal undulations of bio-membranes DOBRIN BOSSEV, ZHENG YI, Indiana University — In this work we discuss the damping mechanisms of the thermal undulation of lipid membranes. In the past, we have attempted to determine the bending elasticity of bio membranes by neutron spin-echo spectroscopy (NSE) as a function of the temperature, molecular structure of the phospholipids, ionic strength of the surrounding aqueous environment, and presence of cholesterol. NSE is ideal for studies of the thermal undulations of the biomembranes because it probes the short correlation times (0.01–100 ns) and length scales (10–100 Å) that are characteristic for the biomembrane undulations. The bending modulus of elasticity is obtained through analysis of the intermediate scattering function I(Q,t) using Zilman-Granek theory, which considers the solution viscosity as the only damping mechanism for the thermal undulations. As a result the absolute k values are about an order of magnitude greater than those measured by other methods and predicted by simulations. Here we report measurements in water/glycerol mixtures in attempt to modify the bulk viscosity and to clarify the contribution of the different energy dissipation mechanisms.

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