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A Simple Analysis of Small-Angle Neutron Scattering Data to Estimate Thickness Fluctuations of the Membrane TAKUMI HAWA, VICTOR LEE, School of Aerospace and Mechanical Engineering, The University of Oklahoma — Small-angle neutron scattering (SANS) and neutron spin echo (NSE) experiments are one of the most important laboratory techniques to investigate structure and dynamic properties of biological and nanotechnology-related membrane systems. Due to the sensitivity of about 1–100 nm length scales, these experimental techniques provide extensive information over a wide variety of technological and scientific applications. Recently, the author and his colleagues studied swollen lamellar structure systems consisting of nonionic surfactant, water, and oil using SANS/NSE and molecular dynamics (MD) simulation. They proposed a new experimental technique to measure the thickness fluctuations of surfactant layers and verified their approach using MD simulations. In this talk a possible simpler approach to estimate the membrane thicknesses and fluctuations directly from the isotropic scattering intensities in the two-dimensional SANS profile will be proposed. Generally, this characteristic feature is reproduced using various scattering theories to estimate the membrane thickness; however, the thickness fluctuation amplitude has never been estimated from the SANS profile. The results obtained from the approach will be compared with the experimental results obtained by Nagao and co-workers.

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