

Abstract Submitted
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Heterogeneous Rotational Diffusion in Lipid Monolayers NEDA DADASHVAND, LANELL A. WILLIAMS, CHRISTINA M. OTHON, Wesleyan Univ — We have developed a new time-resolved fluorescence platform which enables us to follow the molecular orientation and dynamics of a lipid monolayer at the air - water interface. The rotational correlation time of the lipid probe NBD-PC is measured using fluorescence anisotropy for two lipid species. We measure the rotational diffusion in a monolayer of DPPC which displays a phase transition at room temperature from the liquid-expanded to the liquid-condensed phase. The constant rotational diffusion of the probe throughout the phase transition reflects the measurement of dynamics in only the liquid-expanded phase. We contrast the dynamic changes during this phase coexistence to the continuous density increase observed in DMPC at room temperature. We observe a non-exponential decay of the probe diffusion consistent with heterogeneity of the orientational dynamics; as the free-volume is reduced the diffusion becomes increasingly heterogeneous.

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