Abstract Submitted
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Diffusion of water on supported bilayer lipid membranes[1] ANDREW MISKOWIEC, ZACHARY BUCK, HELMUT KAISER, HASKELL TAUB, University of Missouri - Columbia, FLEMMING HANSEN, Technical University of Denmark, MADHUSUDAN TYAGI, NIST Center for Neutron Research, SOULEYMANE DIALLO, EUGENE MAMONTOV, KENNETH HERWIG, Oak Ridge National Laboratory — We compare the temperature dependence of quasielastic incoherent neutron scattering from water associated with fully hydrated single bilayers of the charge-neutral DMPC (dimyristoylphosphocholine) lipid supported on a SiO_2-coated silicon substrate to that of water in proximity to a similarly supported *anionic* DMPG (dimyristoylphosphoglycerol) bilayer. The diffusion constant of water near the DMPC membrane decreases on cooling in two step-like transitions: 1) at the freezing point of bulk-like water (267 K); and 2) at a second transition of unknown origin at 261 K [2]. In contrast, we observe on cooling only a continuous decrease in the diffusion constant of water in proximity to the DMPG membrane. Water remains mobile to lower temperature on the anionic membrane; however, its diffusion is systematically slower than on DMPC in the temperature range above 255 K where water is mobile in both systems. [2] M. Bai *et al.*, Europhys. Lett. **98**, 48006 (2012).

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Andrew Miskowiec
University of Missouri - Columbia

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