

147. Title: Long-Range Hydration Effect of Lipid Membrane Studied by Terahertz Time-Domain Spectroscopy

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Abstract: The hydration state of biomolecules is believed to affect their self-assembly. The hydration state of phospholipid bilayers is studied precisely by terahertz spectroscopy, by which water perturbed by a lipid membrane is detected sensitively from the observation of the relaxation dynamics of water molecules in the subpicosecond time scale. Combined with x-ray observation of the lamellar structure of the lipid, a long-range hydration effect on up to 4-5 layers of water is confirmed. Most water molecules in the lamellae fall into the hydration water, and condensation of them is also indicated.