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**Dielectric Response of Thin Surface Water Layer** FENG CHEN, JASON SHULMAN, RAFAEL LONGORIA, STEPHEN TSUI, YUYI XUE, C. W. CHU<sup>1</sup>, Texas Center for Superconductivity, University of Houston, Houston, TX 77204-5002 — Recently, we have reported a negative dielectric constant ( $\epsilon'$ ) for various nano-particle assemblies (urea-coated  $\text{Ba}_{0.8}\text{Rb}_{0.4}\text{TiO}(\text{C}_2\text{O}_4)_2$  and  $\text{Al}_2\text{O}_3$  *et al*). There is a close correlation between the zero-frequency electrical conductivity and the occurrence of the negative  $\epsilon'$ . The large surface area of the nano-assemblies and moisture level play an important role. To determine the surface water effect on the negative  $\epsilon'$ , we carried out different dielectric measurements (time and frequency domain with different bias voltages) for differently prepared surfaces with controlled humidities. We will present our data and analysis for surface water ranging from a few layers to 100  $\mu\text{m}$ . The contribution of water decomposition by electrolysis to  $\epsilon'$  will also be evaluated.

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