

Abstract Submitted
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Phase-Sensitive Sum-Frequency Vibrational Spectroscopy of Water on Hydrophilic and Hydrophobic Interfaces¹ VICTOR OSTROVERKHOV, Department of Physics, University of California, Berkeley, GLENN A. WAYCHUNAS, Earth Sciences Division, Lawrence Berkeley National Laboratory, YUEN RON SHEN, Department of Physics, University of California, Berkeley — Water structures at hydrophilic and hydrophobic interfaces are relevant to many problems in various disciplines. Sum-frequency vibrational spectroscopy (SFVS) is a unique technique to study such interfaces at the molecular level. We have developed a phase-sensitive SFVS method that provides both magnitude and phase of the non-linear spectral response from the interfaces, and allows more detailed understanding of the interfacial structure including water molecular orientations at different adsorption sites. We have studied water organization on hydrophilic quartz surfaces as well as surfactant-covered quartz surfaces. It is seen that the orientations of water molecules responsible for the ice-like and liquid-like peaks respond differently to variation of the bulk pH values. They are also different for hydrophilic and hydrophobic interfaces despite some similarities in the spectra.

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