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Phase-sensitive sum-frequency vibrational spectroscopy on water/vapor interfaces[1] VICTOR OSTROVERKHOV, NA JI, CHAO-YUAN CHEN, YUEN-RON SHEN, Department of Physics, University of California, Berkeley — Water/vapor interfaces are ideal hydrophobic interfaces relevant to many important applications. They have been studied extensively by sum-frequency vibrational spectroscopy (SFVS) in recent years. Unfortunately, different interpretations of the spectra from different research groups have led to a great deal of confusion. The problem arises because in conventional SFVS, only the magnitude of the spectrum is recorded. We present here a phase-sensitive (PS) SFVS study of water/vapor interfaces that captures both the magnitude and the phase of an interfacial vibrational spectrum. The results allow us to decompose unequivocally the various OH stretch peaks in the spectrum and the net polar orientations of the water species contributing to the peaks.

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