

Abstract Submitted
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Instability of Water/Quartz Interfaces¹ WEITAO LIU, YUEN-RON SHEN, Department of Physics, University of California Berkeley, California 94720 — Water/quartz interfaces play an important role in modern industry and environmental science, but as buried interfaces, they have not been well studied because of lack of experimental tools. Recently, second harmonic generation (SHG) and sum-frequency spectroscopy have been used to obtain valuable information about the interfaces. However, it was found that the results are often difficult to reproduce quantitatively even on the daily basis, suggesting that the interfacial structure may be continually varying in time. We used SHG to monitor the interface with different bulk pH in water, and observed the fluctuation of the signal over long periods of time, signifying that the interfacial structure could be unstable. After a sizable adjustment of the pH value, it took about 1hr for the SHG signal to reach some sort of equilibrium, but the fluctuations remain significant. Similar results on other water/oxide interfaces were obtained. SHG appears to be a valuable tool for monitoring interfacial instability. This work was supported by the National Science Foundation Science and Technology Center of Advanced Materials for Purification of Water with Systems (Water CAMPWS; #CTS-0120978).

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