

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

**Nonlinear Optical Studies of Self-Assembled Monolayers (SAM)
Silica-SAM-Water Interface Probed With Second Harmonic Generation**

HARRY W.K. TOM, KENNETH JAMES, University of California Riverside —
Second harmonic generation (SHG) is a successful and widely used technique for the study of surfaces and surface phenomena. We present a novel technique using second harmonic generation from oriented water molecules in the Gouy-Chapman diffuse layer at the alkylsiloxane and biomolecular self assembled monolayer (SAM) interface with water to measure distance between the solid surface and the average location of the oriented water in the diffuse layer. Distances of one nanometer can be distinguished. This in situ probe is applicable for organic adsorbates which in general will push the diffuse layer away from the solid surface. The organic layer thickness can be used to obtain the adsorption fraction. From this and an understanding of the likely chemistry, the orientation of the molecules can be inferred. We have demonstrated this technique on three molecular systems: hydrophobic self assembled monolayers of methoxysilane molecules of varying hydrocarbon chain length, self assembled monolayers of streptavidin glycoproteins and the combined streptavidin-biotinylated antibody monolayer.

Kenneth James
University of California Riverside

Date submitted: 15 Mar 2010

Electronic form version 1.4