Abstract Submitted
for the MAR05 Meeting of
The American Physical Society

Sub-THz oscillations in liquid water probed with terahertz time-domain spectroscopy.[1] JASON MCNARY, HARRY W.K. TOM, University of California, Riverside — Terahertz time domain spectroscopy is used to probe liquid water over a range of temperatures from 0.5 ^{o}C to 20 ^{o}C and across frequencies from 20 GHz to 2 THz. The experiments were performed with a THz spectrometer that has been specifically designed and optimized for the generation and collection of sub-THz frequencies and it has a single scan signal-to-noise ratio <1% at 150 GHz. The spectrum of water in this range shows a significant deviation from the standard double Debye fit for liquid water that can only be fit by several low frequency Lorentzian oscillators. This is suggestive of collective modes of behavior of water molecules in the hydrogen bond network. The results of this experiment lays the necessary groundwork for being able to examine proteins and biological materials in aqueous solutions.

[1]Funded under NSF-9554506

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Date submitted: 07 Dec 2004 Electronic form version 1.4