Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Reconstructing the dynamics of water sheared between charged plates using inelastic x-ray scattering GHEE HWEE LAI, ROBERT H. CORIDAN, NATHAN W. SCHMIDT, PETER M. ABBAMONTE, GERARD C. L. WONG, UIUC — Understanding the dynamical behavior of water under confinement or near surfaces is fundamental to tribology and many transport processes in cell biology. To achieve angstrom and femtosecond resolution in water dynamics, we reconstruct the space-time longitudinal (density) response function from high-resolution inelastic x-ray scattering (IXS) studies of water and, together with linear response theory, investigate how water behaves between two moving 2-D charge lattices at different charge densities and inter-plate separations. We find that the density profile varies with plate separation with a periodicity close to the diameter of a water molecule ($\sim$2.6Å), in agreement with surface forces apparatus measurements, and that the hydration patterns of charges on the surfaces are strongly velocity dependent.

Ghee Hwee Lai
UIUC

Date submitted: 27 Nov 2007 Electronic form version 1.4