MAR09-2008-000177

Abstract for an Invited Paper
for the MAR09 Meeting of
the American Physical Society

Femtosecond Sum-Frequency Generation Studies of the Structure and Dynamics of Interfacial Water

MISCHA BONN, FOM Institute for Atomic and Molecular Physics (AMOLF)

Water interfaces play a central role in a wide variety of disciplines including electrochemistry, (photo-) catalysis and biophysics. Knowledge of the details of water interfacial structure is thus essential both for a fundamental understanding of this ubiquitous liquid and for a basic understanding of the many systems in which aqueous interfaces play a key role. Although considerable progress has been made in understanding of bulk water, substantially less progress has been made at the interface. Here we report a series of surface specific studies of various water interfaces using surface-specific vibrational spectroscopies, both in equilibrium and on ultrafast (femtosecond) time scales. Our approach allows us to selectively investigate the one monolayer of water molecules at the different water interfaces. Water is characterized through its O-H stretch vibration. We find that interfacial hydrogen bonding depends strongly in the type of interface. Remarkably, for the water-air interface, interfacial hydrogen bonding is very similar to that occurring in bulk.