Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

X-ray studies of the Density Depletion at Hydrophobic Water-Solid Interfaces MARKUS MEZGER, Lawrence Berkeley National Lab, Berkeley, HARALD REICHERT, HEIKO SCHRODER, JOHN OKASINSKI, ROLAND ROTH, HELMUT DOSCH, Max Planck Institute for Metals Research, Stuttgart, Germany, SEBASTIAN SCHODER, VEIJO HONKIMAKI, European Synchrotron Radiation Facility, Grenoble, France, JOHN RALSTON, Ian Wark Research Institute, Mawson Lakes, Australia — Deeply buried hydrophobic solid-water interfaces were probed with high-energy x-ray reflectivity. The experimental data provide clear evidence for a thin density depletion with an integrated deficit corresponding to approximately 40% of a water monolayer extending over a maximum of two molecular layers. In addition, measurements on the influence of gases (Ar, Xe, Kr, N_2, O_2, CO, CO_2) dissolved in the water have been performed. No effect on the hydrophobic water gap was found. The presence of nanobubbles at the interface could also be excluded. By comparing the experimental results with an generic DFT model we can give a quantitative estimation for different contributions to the observed gap size.

[1] M. Mezger *et al.*, *Proc. Natl. Acad. Sci. USA* **103**, 18401 (2006).
[2] M. Mezger *et al.*, *J. Chem. Phys.* **128**, 244705 (2008).

Markus Mezger
Lawrence Berkeley National Lab, Berkeley

Date submitted: 01 Dec 2008 Electronic form version 1.4