

Abstract Submitted  
for the MAR08 Meeting of  
The American Physical Society

**Lithium, magnesium and sodium  $^4\text{He}$  adsorption experiments performed below 1K.** ELI VAN CLEVE, PETER TABOREK, JAMES RUTLEDGE, University of California, Irvine — We have constructed a  $^3\text{He}$  optical cryostat and used a previously developed technique of Cryogenic Pulsed Laser Deposition (CPLD) <sup>(1)</sup>, to deposit films of sodium, lithium and magnesium onto the surfaces of quartz crystal microbalances at cryogenic temperatures. The elements in the first and second column of the periodic table interact weakly with adsorbed helium. Theoretical calculations predict that helium will wet all the elements lighter than rubidium, but solid-like layers will not form, so liquid and superfluid films can exist at sub-monolayer coverage. We will present vapor pressure isotherms on Li, Mg and Na substrates in the temperature range 0.5K -1.3K and discuss the wetting and superfluid onset behavior. We will also present in-situ optical work function measurements of the metallic films, and discuss the relation between work function and wettability. <sup>(1)</sup> E. Van Cleve, P. Taborek, J.E. Rutledge JLTP online

Eli Van Cleve  
University of California, Irvine

Date submitted: 27 Nov 2007

Electronic form version 1.4