

Abstract Submitted  
for the NWS08 Meeting of  
The American Physical Society

**Detection of adsorbed gas atoms on a suspended single-walled carbon nanotube balance**<sup>1</sup> ZENGHUI WANG, JIANG WEI, OSCAR VILCHES, DAVID COBDEN, University of Washington — A monolayer of gas atoms or molecules adsorbed on a suspended single-walled carbon nanotube offers the opportunity to study the phases and phase transitions of a unique low dimensional system. The adsorbed phases are expected to resemble the well studied 2D monolayers on planar graphite, but with modified binding energies, curvature effects, reduced grain size effects, and cylindrical boundary conditions imposed. The adsorbed mass can be detected by using the nanotube itself as a vibrating balance whose resonant frequency shifts when adsorbates add mass to it. We have developed a vibrating nanotube balance with which we have measured the mass adsorption vs equilibrium vapor pressure for Ar at 77 K. We will describe the development of the nanotube balance, the measurement technique, and the sensitivity of the method (of the order of 100 atoms or less), and compare our results with the well known adsorption isotherm of Ar on exfoliated graphite at this temperature. Comparison with other gases (Kr and N<sub>2</sub>) at this temperature is in progress.

<sup>1</sup>Work supported by NSF 0606078 and the ACS Petroleum Research Fund 44249-AC5.

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Date submitted: 18 Apr 2008

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