Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

High pressure optical properties of sodium AMY LAZICKI, ALEXANDER GONCHAROV, VIKTOR STRUZHKIN, ZHENXIAN LIU, Carnegie Institution of Washington, EUGENE GREGORYANZ, CHRISTOPHE GUILLAUME, University of Edinburgh, HO-KWANG MAO, RUSSEL HEMLEY, Carnegie Institution of Washington — Sodium displays significant complexity at high pressure. The melting temperature drops above a critical pressure, nearly reaching ambient temperature by 120 GPa. In the same pressure regime, phase transitions to low-symmetry and incommensurate structures are observed. Computational studies predict a decrease in the metallic character, and experimental observations have indicated this as well. We present infrared reflectivity for Na through the high pressure incommensurate phase, revealing a significant drop near 120 GPa. First principles calculations of the optical properties are compared to values derived from a Kramer's Kronig analysis of the experimental IR reflectivity, revealing the detailed nature of the pressure-induced deviations from simple metallic behavior.

Amy Lazicki
Carnegie Institution of Washington

Date submitted: 21 Nov 2008 Electronic form version 1.4