Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Graphite under high pressure YUEJIAN WANG, Yale University — As one of the longest-known forms of carbon, graphite has been extensively studied for several decades. However, its phase diagram under high pressures is still poorly understood. Here we use both in-situ high-pressure Raman spectroscopy and synchrotron x-ray diffraction, collected on both compression and decompression, to elucidate the high-pressure behavior of highly-ordered pyrolitic graphite (HOPG) at room temperature. The Raman spectra show that G band (1580 cm^{-1} at ambient pressure) of HOPG shifts to higher frequency with increased pressure, which has been attributed to pressure-induced in-plane lattice contraction. Above 19 GPa the broadening of this Raman peak indicates a reordering of the atomic structure, and is consistent with synchrotron x-ray diffraction measurements that also show a slight change in symmetry.

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Date submitted: 28 Nov 2010 Electronic form version 1.4