

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Diamond as a high pressure gauge up to 2.7 MBar** NATALIA DUBROVINSKAIA, LEONID DUBROVINSKY, RAZVAN CARACAS, MICHAEL HANFLAND — Diamond anvil cell (DAC) technique has become a very important method of probing materials behaviour under pressure in various fields of research ranging from physics to biology and geosciences. Optical methods of pressure determining in DAC experiments are based on fluorescent markers or calibrated pressure dependence of the Raman shift of suitable materials. Diamond has been since long recognised as a good pressure marker in experiments conducted in a diamond anvil cell. It is stable at ultra-high pressures that allows one to use the pressure dependence of the Raman frequency of the LTO optical phonon of diamond as a pressure gauge. A pressure gauge is a key issue of any high pressure experiment in a diamond anvil cell. Here we present a method of *in situ* synthesis of microcrystals of diamond that can be further used as a pressure standard in course of the same DAC experiment. Calibration curve of the Raman shift *vs* pressure is extended up to 270 GPa and experimental results are compared with those of *ab initio* calculations.

Natalia Dubrovinskaia

Date submitted: 16 Nov 2010

Electronic form version 1.4