Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Sensing the Local Charge and Strain Environment of Nitrogen Vacancy Centers in Diamond PRABUDHYA BHATTACHARYYA, SATCHER HSIEH, THOMAS MITTIGA, BRYCE KORBIN, FRANCISCO MACHADO, CHONG ZU, THOMAS SMART, UC Berkeley, SOONWON CHOI, Harvard University, VIKTOR STRUZHKIN, Carnegie Institution of Washington, RAYMOND JEANLOZ, NORMAN YAO, UC Berkeley — The Nitrogen Vacancy (NV) center in diamond has emerged as a promising candidate for nanoscale sensing, in part, because of its sensitivity to a myriad of external parameters. However, coupling to local *internal* strain and electric fields (i.e. in the diamond host) can suppress this sensitivity to external signals. This is especially important in high density ensembles, where one leverages spin correlations to perform enhanced spectroscopy. We demonstrate that in such samples, spectral features typically attributed to internal strain in fact result from electric fields originating from local charged defects. We distinguish between the effects of strain and electric fields by using diamond anvil cells to characterize the elastic response of NV centers in the gigapascal regime. Under these conditions, we investigate the charge dynamics of the NV center and reconstruct the complete strain tensor within the anvil cell.

Prabudhya Bhattacharyya
University of California, Berkeley

Date submitted: 26 Jan 2018 Electronic form version 1.4