

Abstract Submitted  
for the MAR17 Meeting of  
The American Physical Society

**Using diamond NV centers to probe magnetic properties of 2d materials** TROND ANDERSEN, JAVIER SANCHEZ-YAMAGISHI, BO DWYER, HONGKUN PARK, MIKHAIL LUKIN, Harvard University — 2d materials have been shown to exhibit a plethora of interesting properties, using a wide range of both electronic, optical and mechanical measurement techniques. Measuring the magnetic field from a 2d material, however, remains challenging due to the small sample volume and corresponding weak magnetic signal. The NV center is an ideal magnetometer for such measurements due to its high magnetic field sensitivity and optical readout capabilities. By transferring 2d materials onto the surface of a diamond that contains shallow NV centers, we achieve nanoscale proximity and thus high sensitivity. This can allow for probing not only intrinsic phenomena, such as current noise from graphene, but also extrinsic ones, like magnetic signals from spin defects. I will discuss our recent progress in conducting such measurements, focusing on techniques to optimize sensitivity, as well as measures made to maximize the magnetic signal from the 2d material.

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Date submitted: 11 Nov 2016

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