Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Sub-surface single ion detection in diamond: A path for deterministic color center creation JOHN ABRAHAM, BRANDON AGUIRRE, JOSE PACHECO, RYAN CAMACHO, EDWARD BIELEJEC, Sandia National Laboratories, SANDIA NATIONAL LABORATORIES TEAM — Deterministic single color center creation remains a critical milestone for the integrated use of diamond color centers. It depends on three components: focused ion beam implantation to control the location, yield improvement to control the activation, and single ion implantation to control the number of implanted ions. A surface electrode detector has been fabricated on diamond where the electron hole pairs generated during ion implantation are used as the detection signal. Results will be presented demonstrating single ion detection. The detection efficiency of the device will be described as a function of implant energy and device geometry. It is anticipated that the controlled introduction of single dopant atoms in diamond will provide a basis for deterministic single localized color centers. This work was performed, in part, at the Center for Integrated Nanotechnologies, an Office of Science User Facility operated for the U.S. Department of Energy Office of Science. Sandia National Laboratories is a multiprogram laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

John Abraham
Sandia National Laboratories

Date submitted: 29 Oct 2015 Electronic form version 1.4