Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Radiation Resistant Hydrogen Microsensors for Fusion Applications[1] D.A. BUCHENAUER, R.J. BASTASZ, J.A. WHALEY, Sandia National Laboratories, California, T.E. LEMP, Sandia National Laboratories, New Mexico — Quantifying the flux and energy of charge exchange neutrals to the walls of fusion experiments is important to understanding wall erosion and energy balance. Quantification of these fluxes is made much more difficult because they have very strong poloidal and toroidal variations. To facilitate such measurements, we have been developing compact, palladium metal oxide semiconductor (Pd-MOS) detectors. These devices are dosemetric detectors, which can evaluate differences between plasma discharges. To become widely used, however, such detectors must be made resistant to UV and x-ray induced damage, as well as high energy particle bombardment. We report here on the fabrication of Schottky diode Pd-MOS devices in which we have minimized the oxide thickness (to reduce the production of charges from UV and x-rays) and increased the Pd overlayer (to reduce charge production from high energy particles). The fabrication has been facilitated through use of an array of metallic posts to improve the Pd film adhesion. The efficacy of the film adhesion and comparison with standard detectors will be examined. Testing and calibration of the detectors is reported as a function of hydrogen flux and energy.

[1]Work supported by US DOE Contract DE-AC04-94AL85000.

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Date submitted: 16 Jul 2010 Electronic form version 1.4