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Effects of Gadolinium dopant on electrical characterization of p-type Silicon diodes

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Abstract: The aim of this paper is to improve the radiation-hardness of silicon diodes. The schottky diodes were fabricated on undoped and gadolinium doped p-type silicon. The electrical properties of the diodes were studied using the current-voltage (I-V) and capacitance-voltage (C-V) techniques. The results show that the silicon diodes have become relaxation-like after doping hence the device shows Ohmic behaviour. This is in concurrence with the presence of the 'midgap defect' in gold and platinum doped devices from literature [1-4]. Erbium and niobium doped silicon have been found to have similar results as gold and platinum. Relaxation material is radiation-hard since the effects of radiation on the device are suppressed. From the preliminary results gadolinium doped silicon shows Ohmic behaviour which has been found to enhance the performance of the diodes in radiation-hard particle detectors.

Keywords: Silicon, gadolinium doped diodes, I-V and C-V, radiation-hard.

References:

- [1] Kwon Y K, Ishikawa T and Kuwano H J. Appl. Phys. 1987; 61 1055.
- [2] Msimanga M, McPherson M and Theron C Radiation Physics and Chemistry 2004; 71 733.
- [3] McPherson M, Sloan T and Jones B K J. Phys. D: Appl. Phys. 1997; 30 3028.
- [4] Moloi S J and McPherson M Physica B 2009; 404 3922.

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yes

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PhD

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