Abstract Submitted
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Electronic characterization of in-grown 8H inclusions in 4H-SiC using Ballistic Electron Emission Microscopy (BEEM) K. -B. PARK, W. CAI, J. P. PELZ, The Ohio State University, M. S. MIAO, W. R. L. LAMBRECHT, Case Western Reserve University, X. ZHANG, M. SKOWRONSKI, Carnegie Melon University, M. A. CAPANO, Purdue University — Planar "8H" Stacking-fault inclusions (SFIs) formed during epilayer growth on an 8^o miscut n-type 4H-SiC substrate were characterized using nm-resolution BEEM and first-principles electronic structure calculations. Enhanced BEEM current and a $\sim$0.39 eV lower local Schottky Barrier were observed along lines where these inclined SFIs intersect a thin Pt film, indicating that 8H SFIs are electron quantum wells (QWs), as observed for two types of cubic SFIs in 4H-SiC [1,2]. The measured $\sim$0.39 eV QW depth is close to our calculated value of $\sim$0.43 eV. We also observed the BEEM current amplitude and threshold voltage to be quite asymmetric with respect to the intersection lines of the SFIs with the Pt film. We will discuss on-going modeling to see if these asymmetries can be explained respectively by electron reflection from the inclined subsurface SFIs, and by the difference in spontaneous polarization between 8H- and 4H-SiC. Work supported by ONR. [1] Ding *et al.*, Phys. Rev. B **69**, 041305(R) (2004). [2] Park *et al.*, Appl. Phys. Lett. **87**, 232103 (2005).

Kibog Park
The Ohio State University

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