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Quantum-well depth of cubic single stacking fault inclusions in 4H-SiC p-i-n diodes determined by Ballistic Electron Emission Microscopy K.-B. PARK, J. P. PELZ, Ohio State University, M. SKOWRONSKI, J. GRIM, Carnegie Melon University — Current-induced single stacking-fault (SF) cubic inclusions formed in (1 1 –2 0) oriented 4H-SiC $p-i-n$ diodes were exposed in cross-section by polishing down to the intrinsic layer. Surprisingly non-leaky Schottky barrier (SB) Pt contacts were made on the polished surface, and were investigated by nm-resolution Ballistic Electron Emission Microscopy (BEEM) [1]. Enhanced BEEM current and a ∼0.25 eV lower SB height was observed over single SF inclusions, directly confirming they act as ∼0.5 nm wide quantum wells (QWs) and support propagating 2D electronic states. This indicates the QW conduction band minimum is ∼0.25 eV lower than the 4H-SiC host, consistent with calculations and much shallower than the ∼0.53 eV depth of double SF inclusions [1]. We also found that the BEEM amplitude (but not the SB height) is extremely sensitive to polishing scratches, likely due to hot-electron scattering from sub-surface defects. Work supported by ONR and NSF. [1] Yi Ding *et al.*, Phys. Rev. B **69**, 041305 (2004)

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