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Structural study of the phase evolution of 6H-SiC(0001) by low energy electron microscopy JIEBING SUN, KARSTEN POHL, University of New Hampshire, RUDOLF M. TROMP, JAMES B. HANNON, IBM T.J. Watson Research Center — The surface phase transition of Si-terminated 6H-SiC(0001) upon heat treatment is studied by low energy electron microscopy (LEEM). Bright and dark field imaging demonstrates a direct *in situ* observation of the surface phase evolution, transitions in a sequence from 1×1, 3×3, $\sqrt{3}\times\sqrt{3}$, $6\sqrt{3}\times6\sqrt{3}$ to the graphene phase due to gradually increasing the temperature. Intensity vs. voltage (IV) spectra extracted from single domain diffraction images is used to determine the local surface structure and chemical stoichiometry. Preliminary results from a quantitative dynamical analysis of the LEEM-IV curves show a Si-depleted 1×1 structure and an adatom-trimer-adlayer structure on 3×3 reconstruction. Ongoing work on the structure of the $\sqrt{3}\times\sqrt{3}$ and $6\sqrt{3}\times6\sqrt{3}$ phases is aimed to unraveling the initial growth mechanism of graphene on SiC.

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