Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Electronic structure of self-assembled Si nanowires on Ag(110) surfaces TAISUKE OHTA, Fritz Haber Institute/LBNL, ELI ROTENBERG, Lawrence Berkeley National Laboratory, KARSTEN HORN, Fritz Haber Institute — Much attention has recently been paid to the physics of one- dimensional (1-D) systems, since exotic properties are predicted from basic theoretical consideration. However, it is not easy to realize such one-dimensional systems experimentally. Recently, Leandri et al.[1] have reported the growth of self-assembled 1D linear structures of silicon on Ag(110), perfectly aligned along [-110] direction and 16$\mathring{A}$ wide. We have investigated the electronic structure of such self-assembled Si nanowires using angle resolved photoemission spectroscopy. The Si 2p core level line shows two narrow components in agreement with earlier work [1]. Silicon-induced features in the valence band region are observed, most clearly within the band gap of the Ag s-p states. The silicon-induced band exhibits a sizeable dispersion only in the direction along the linear structure, i.e. the [- 110] azimuth of the Ag(110) substrate. Details of the experimentally observed bands will be presented and related to the atomic structure within the 1D structure and its arrangement on the silver substrate. T.O. acknowledges financial support from Max Planck Society. Experiments were performed at the Advanced Light Source, Lawrence Berkeley National Laboratory operated by the U.S. DOE under Contract No. DE-AC03-76SF00098. [1] C. Leandri et al., Self-aligned silicon quantum wires on Ag (110), Surface Science 574 (2005) L9L15

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Date submitted: 29 Nov 2005 Electronic form version 1.4