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Electronic and structural properties of epitaxial silicene on h-BN-terminated ZrB_2 FRANK WIGGERS, MESA+ Institute for Nanotechnology, University of Twente, 7500 AE Enschede, The Netherlands, ANTOINE FLEURENCE, KOHEI AOYAGI, TAKAHIRO YONEZAWA, YUKIKO YAMADA-TAKAMURA, Japan Advanced Institute of Science and Technology, School of Materials Science, Nomi, Ishikawa 923-1292, Japan, HAIFENG FENG, JINCHENG ZHUANG, YI DU, Institute for Superconducting and Electronic Materials, University of Wollongong, Wollongong, New South Wales 2525, Australia, ALEXEY KOVALGIN, MICHEL DE JONG, MESA+ Institute for Nanotechnology, University of Twente, 7500 AE Enschede, The Netherlands — Silicene is a two-dimensional (2D) material consisting of an atomically buckled honeycomb lattice of Si atoms. Its attractive predicted properties include an electrically tunable bandgap and the quantum spin Hall effect. Free-standing silicene has not been synthesized to date, but epitaxial silicene layers have been reported on a number of metallic substrates, amongst which $ZrB_2(0001)$ thin films on Si(111) [1]. These substrates have a non-negligible effect on the electronic properties of the silicene due to hybridization effects. We have investigated epitaxial silicene on $ZrB_2(0001)$ surfaces terminated with an insulating, epitaxial h-BN monolayer [2]. I will discuss the electronic and structural properties of such silicene layers, based on synchrotron-based (angle-resolved) photoelectron spectroscopy and scanning tunneling microscopy studies. [1] A. Fleurence, et al., Phys. Rev. Lett. 108, 245501 (2012) [2] K. Aoyagi, et al., to be submitted.

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