

Abstract Submitted
for the SES10 Meeting of
The American Physical Society

BaFe₂As₂ Surface Domains and Domain Walls: Mirroring the Bulk Spin Structure GUORONG LI, XIAOBO HE, Louisiana State University, LA, ANG LI, University of Houston, Houston, TX, SHUHENG PAN, University of Houston, TX, JIANDI ZHANG, RONGYING JIN, Louisiana State University, LA, ATHENA S. SEFAT, MICHAEL A. MCGUIRE, Oak Ridge National Laboratory, TN, DAVID G. MANDRUS, Oak Ridge National Laboratory and The University of Tennessee, TN, BRAIN C. SALES, Oak Ridge National Laboratory, TN, WARD PLUMMER, Louisiana State University, LA — We have used scanning tunneling microscopy/spectroscopy (STM/STS) to investigate the geometric and electronic structure at the (001) surface of the parent compound BaFe₂As₂. While high-resolution STM measurements reveals a (1x1) As-terminated unit cell on the (001) surface, there are significant differences of the surface unit cell compared to the bulk: only one of the two As atoms in the unit cell is imaged and domain walls between different (1x1) regions display a C₂ symmetry at the surface. It should have been C_{2v} if the STM image reflected the geometric structure of the surface or the orthorhombic bulk. The inequivalent As atoms and the bias dependence of the domain walls indicate that the origin of the STM image is primarily electronic not geometric. We argue that the surface electronic topography mirrors the bulk spin structure of BaFe₂As₂, via strong orbital-spin coupling.

Guorong Li
Louisiana State University, LA

Date submitted: 13 Aug 2010

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