

Abstract Submitted
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Maze-like surface reconstruction on pure SrFe₂As₂ observed by STM/STS¹ MICHAEL DREYER, MARK GUBRUD, HUI WANG, SHANTA SAHA, NICK BUTCH, KEVIN KIRSHENBAUM, JOHNPIERRE PAGLIONE, University of Maryland — We measured undoped SrFe₂As₂ samples using a low temperature scanning tunneling microscope. Similar samples showed superconductivity in up to 15% of its volume in measurements of the diamagnetic screening although being undoped as confirmed by energy dispersive x-ray spectroscopy. The samples were cleaved at room temperature at a pressure $P < 10^{-8}$ mbar before introducing them into the low temperature scanning tunneling microscope (LTSTM) operating at a temperature of $T = 4.2$ K. Beside the usual striped surface reconstruction and disordered regions we observed areas showing a maze like reconstruction. Atomically resolved images strongly suggest that the maze structure is formed by adatoms and thus, by inference, is the striped phase. Scanning tunneling spectroscopy (STS) measurements showed a superconducting gap on both the striped and maze phase of the sample, similar to the spectra on a cobalt doped sample. The results will be discussed in detail.

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Michael Dreyer
University of Maryland

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