Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Fermi surface deformation in a simple iron-based superconductor, FeSe[1] AMALIA COLDEA, MATTHEW WATSON, University of Oxford, UK, TIMUR KIM, Diamond Light Source, UK, AMIR HAGHIGHIRAD, University of Oxford, UK, ALIX MCCOLLAM, High Field Magnet Laboratory, Nijmegen, The Netherlands, MORITZ HOESCH, Diamond Light Source, UK, ANDREW SCHOFIELD, University of Birmingham — One of the outstanding problems in the field superconductivity is the identification of the normal state out of which superconductivity emerges. FeSe is one of the simplest and most intriguing iron-based superconductors, since in its bulk form it undergoes a structural transition before it becomes superconducting, whereas its single-layer form is believed to be a high-temperature superconductor. The nature of the structural transition, occurring in the absence of static magnetism, is rather unusual and how the electronic structure is stabilized by breaking of the rotational symmetry is the key to understand the superconductivity in bulk FeSe. Here we report angle-resolved photoemission spectroscopy measurements on FeSe that gives direct access to the band structure and orbital-dependent effects. We complement our studies on bulk FeSe with low-temperature angular-dependent quantum oscillation measurements using applied magnetic fields that are sufficiently strong to suppress superconductivity and reach the normal state. These studies reveal a strong deformation of Fermi surface through the structural transition driven by electronic correlations and orbital-dependent effects. .

[1]This work was supported by EPSRC, UK (EP/I004475/1), Diamond Light Source, UK and HFML, Nijmegen.

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Date submitted: 14 Nov 2014 Electronic form version 1.4