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chalcogenide superconductors".

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Tuning the electronic structure of bulk FeSe with chemical pressure using quantum oscillations and angle resolved photoemission spectroscopy (ARPES)

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FeSe is a unique and intriguing superconductor which can be tuned into a high temperature superconducting state using applied pressure, chemical intercalation and surface doping. In the absence of magnetism, the structural transition in FeSe is believed to be electronically driven, with the orbital degrees of freedom playing an important part [1]. This scenario supports the stabilization of a nematic state in FeSe, which manifests as a Fermi surface deformation in the presence of strong interactions, as detected by ARPES [1]. Another manifestation of the nematicity is the enhanced nematic susceptibility determined from elastoresistance measurements under applied strain [1]. Isovalent Sulphur substitution onto the Selenium site constitutes a chemical pressure, which subtly modifies the electronic structure of FeSe, suppressing the structural transition without inducing high temperature superconductivity [3]. I will present the evolution of the electronic structure with chemical pressure in FeSe, as determined from quantum oscillations [1,2] and ARPES studies [3] and I will discuss the suppression of the nematic electronic state and the role of electronic correlations. Experiments were performed at high magnetic field facilities in Tallahassee, Nijmegen and Toulouse and Diamond Light Source, UK. This work is mainly supported by EPSRC, UK (EP/I004475/1, EP/I017836/1) and I acknowledge my collaborators from Refs. [1-3] . [1] Phys. Rev. B 91, 155106 (2015); [2] Phys. Rev. Lett. 115, 027006 (2015); [3] Phys. Rev. B 92, 121108 (2015).