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Fermi surface of superconducting LaFePO determined from quantum oscillations[1] AMALIA COLDEA, J. FLETCHER, A. CARRINGTON, Bristol University, J. ANALYTIS, Stanford University, C. ANDREW, A. BANGURA, Bristol University, J.-H. CHU, A. ERICKSON, I. FISHER, Stanford University, N. HUSSEY, Bristol University, R. MCDONALD, NHMFL, Los Alamos National Laboratory — We report extensive measurements of quantum oscillations in the normal state of LaFePO, using low temperature torque magnetometry and transport in high static magnetic fields (45 T). LaFePO is a bulk Fe-based superconductor ($Tc\sim$ 6 K) which can be grown in high quality single crystalline form being isostructural to LaFeAsO but without being affected by magnetic or structural transitions at low temperatures. We find that the Fermi surface is that of a compensated metal in broad agreement with the band-structure calculations with frequencies varying between 2.8% to 9% of the basal plane area of the Brillouin zone. The effective masses vary between 1.7-2.1 me and the electronic correlations in LaFePO are moderate corresponding to a mass enhancement of about $\sim$2. The observed variation in the electronic scattering between different bands may be related to their different orbital character. The quasi-two dimensional Fermi surface consists of nearly-nested electron and hole pockets, suggesting proximity to a spin/charge density wave instability. The upper critical field anisotropy is a factor $\sim$10 (at 0.325 K) which may linked to its increased two-dimensionality (PRL **101**, 216402 (2008)).

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