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Anisotropic Energy-Gaps of Iron-based Superconductivity from Intra-band Quasiparticle Interference in LiFeAs, Part I M.P. ALLAN, Brookhaven National Laboratory, University of St Andrews, Cornell University, A.W. ROST, Cornell University, University of St Andrews, A.P. MACKENZIE, University of St Andrews, YANG XIE, Cornell University, J.C. DAVIS, Brookhaven National Laboratory, Cornell University, University of St Andrews, Kavli Institute at Cornell for Nanoscale Science, K. KIHOU, C.-H. LEE, A. IYO, H. EISAKI, Institute of Advanced Industrial Science and Technology, Tsukuba, Japan, T.-M. CHUANG, Academica Sinica, Taipei, Taiwan — Cooper pairing in the iron-based high-T_c superconductors is thought to occur due to the projection of the antiferromagnetic interactions between neighboring iron atoms onto the complex momentum-space electronic structure. It is thus pivotal to have an exact measurement of the electronic structure in these materials. In this talk, I will introduce intra-band Bogoliubov quasiparticle scattering interference (QPI) to iron-based superconductor studies. We report a precise determination of the low energy band structure of LiFeAs using QPI. We observe three hole-like bands, in qualitative agreement with dHvA and ARPES studies ("γ, α_2 & α_1"). The quantitative determination of the bandstructure is the foundation that we later use to measure the superconducting gap structure with QPI.

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