

Abstract Submitted  
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**Pulsed-field contactless mapping of the anisotropic upper critical field in LiFeAs superconducting crystals** K. CHO, H. KIM, M.A. TANATAR, R. PROZOROV, Ames Laboratory, USA, Y.J. SONG, Y.S. KWON, Sungkyunkwan University, Rep. of Korea, W.A. CONIGLIO, C.C. AGOSTA, Clark University, USA, A. GUREVICH, National High Magnetic Field Laboratory, USA — Angle - resolved measurements of the upper critical field were performed using a tunnel diode resonator in the stoichiometric iron arsenide superconductor LiFeAs ( $T_c=18$  K) in pulsed magnetic fields up to 50 T at temperatures down to 0.6 K. Complete  $H_{c2}^{\parallel c}(T)$  and  $H_{c2}^{\perp c}(T)$  curves with  $T \rightarrow 0$  extrapolated values of  $H_{c2}^{\parallel c}(0) = 17 \pm 1$  T and  $H_{c2}^{\perp c}(T) = 26 \pm 1$  T were obtained. The anisotropy,  $\gamma_{H_{c2}} \equiv H_{c2}^{\perp c}/H_{c2}^{\parallel c} \approx 2$ , close to  $T_c$  has revealed the essentially three-dimensional electronic structure of the material. Both temperature - dependent  $H_{c2}(T)$  can be well fit within a single set of band structure, magnetism and scattering parameters. In a configuration with  $H \parallel c$ ,  $H_{c2}^{\parallel c}(T)$  is limited by orbital effects with modest scattering. In the perpendicular orientation,  $H_{c2}^{\perp c}(T)$  shows a notable low-temperature saturation and a strong departure from the orbital Werthamer-Helfand-Hohenberg model. Instead, fitting results suggest paramagnetic Pauli limiting and the development of a spatially - modulated superconducting state.

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