

Abstract Submitted  
for the MAR17 Meeting of  
The American Physical Society

**In-plane resistivity anisotropy in mechanically and magnetic field detwinned single crystals of  $\text{EuFe}_2\text{As}_2$** <sup>1</sup> ERIK TIMMONS, MAKARIY TANATAR, WILLIAM MEIER, TAI KONG, SERGUEI BUDKO, PAUL CANFIELD, RUSLAN PROZOROV, Iowa State Univ and Ames Laboratory — The in-plane resistivity of  $\text{EuFe}_2\text{As}_2$  (Eu122) shows anomalies at the nematic/magnetic ordering temperature of Fe ions,  $T_N^{\text{Fe}} \approx 190$  K, as well as of Eu ions,  $T_N^{\text{Eu}} \approx 19$  K. When the crystal is detwinned by mechanical strain, resistivity along the  $a$ -orthorhombic direction is lowered at all temperatures  $T < T_N^{\text{Fe}}$ , similar to other parent 122 compounds such as Sr122 and Ba122 [1]. Application of a 3 T in-plane magnetic field below  $T_N^{\text{Eu}}$  leads to the structural detwinning with  $a$ -axis following field direction and persistent up to  $T_N^{\text{Fe}}$  [2]. On contrary,  $a$ -axis direction is fixed in strained samples.

[1]E. C. Blomberg et al., Phys. Rev. B 83, 134505 (2011)

[2]S. Zapf et al., Phys. Rev. Lett. 113, 227001 (2014)

[3]Y. Xiao et al., Phys. Rev. B 81, 220406 (2010)

<sup>1</sup>Supported by the USDOE/Office of Science BES Materials Science and Engineering Division under contract # DE- AC02-07CH11358.

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Date submitted: 13 Apr 2017

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