Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

In-plane Resistivity Anisotropy in Mechanically De- twinned Single Crystals FeSe ERIK TIMMONS, MAKARIY TANATAR, The Ames Laboratory and Iowa State University, ANNA BOHMER, The Ames Laboratory, GIL DRACHUCK, Iowa State University, VALENTIN TAUFOUR, SERGEY BUD'KO, PAUL CANFIELD, RUSLAN PROZOROV, The Ames Laboratory and Iowa State University, MICHAEL SCHUETT, RAFAEL FERNANDES, University of Minnesota, RUSLAN PROZOROV GROUP TEAM, PAUL CANFIELD GROUP TEAM, RAFAEL FERNANDES GROUP TEAM — The in-plane resistivity anisotropy was studied in stress-detwinned vapor transport grown single crystals of FeSe, which exhibit the tetragonal-orthorhombic structural transition temperature at $T_s \sim 90$ K in unstrained samples, but no long-range magnetic order. Direct transport and elastoresistivity measurements show a significant in-plane resistivity anisotropy above T_s induced by a very moderate mechanical stress. This anisotropy peaks slightly below T_s and decreases to nearly zero on cooling to base temperature, while the degree of orthorhombic distortion grows monotonically before saturating at low temperatures. We explain the non-monotonic temperature dependence of the resistivity anisotropy as a result of the inelastic scattering of electrons by anisotropic spin fluctuations. Experimental work was supported by the U.S. DOE/OS/MSED and was performed at the Ames Laboratory, Iowa State University under contract DE-AC02-07CH11358. M.S. acknowledges the support from the Humboldt Foundation. R.M.F. is supported by the U.S. DOE, Office of Science, Basic Energy Sciences, under Award No. DE-SC0012336.

Erik Timmons
Iowa State Univ

Date submitted: 05 Nov 2015 Electronic form version 1.4