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Doping-Driven Collapse of the SDW Correlation Gap in $\mathbf{SmFeAsO_{1-x}F_x}$[1] J.B. KEMPER, SCOTT C. RIGGS, Z. STEGEN, G.S. BOEBINGER, National High Magnetic Field Laboratory - Florida State University, R.D. MACDONALD, F.F. BALAKIREV, Y. KOHAMA, A. MIGLIORI, National High Magnetic Field Laboratory - Los Alamos National Laboratory, H. CHEN, R.H. LIU, X.H. CHEN, Hefei National Laboratory and University of Science and Technology of China — We have investigated the Hall resistivity, ρ_{xy} of polycrystalline $SmFeAsO_{1-x}F_x$ for four different fluorine concentrations from the onset of superconductivity through the collapse of the structural phase transition. For the two more highly-doped samples, ρ_{xy} is linear in magnetic field up to 50 T with only weak temperature dependence, reminiscent of a simple Fermi liquid. For the lightly-doped samples with $x < 0.15$, we find a low temperature regime characterized $\rho_{xy}(H)$ being both non-linear in magnetic field and strongly temperature dependent even though the Hall angle is small. The onset temperature for this non- linear regime is in the vicinity of the structural phase (SPT)/spin density wave (SDW) transitions. The temperature dependence of the Hall resistivity is consistent with a thermal activation of carriers across an energy gap. The evolution of the energy gap with doping is reported.

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Jonathon Kemper
Florida State University

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