Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Electronic anisotropy from magneto-transport near T_c in $SmFeAs(O_{0.7}F_{0.25})$ and $(Ba,Rb)Fe_2As_2$ single crystals PHILIP MOLL, Laboratory for Solid State Physics, ETH Zurich, Switzerland, KARSTEN KUNZE, Electron Microscopy ETH Zurich, Switzerland, ZBIGNIEW BUKOWSKI, NIKOLAI ZHIGADLO, JANUSZ KARPINSKI, High Pressure Materials Synthesis, ETH Zurich, Switzerland, BERTRAM BATLOGG, Laboratory for Solid State Physics, ETH Zurich, Switzerland — We derived thermally activated flux flow (TAFF) activation energies E_a(H) and the upper critical fields $\mathbf{Hc}_2$(T) parallel to the c-axis and in the Lorentz-force free configuration ($\mathbf{H} \parallel \mathbf{ab} \parallel \mathbf{j}$) of $SmFeAs(O_{0.7}F_{0.25})$ and $(Ba,Rb)Fe_2As_2$ single crystals from resistance measurements and compare them to the ones reported for other REFeAs(OF). A perfectly rectangular rod (67x11x4 μm), aligned with the crystal axes, was cut from a larger $SmFeAs(O_{0.7}F_{0.25})$ single crystal ($\sim$ 200 μm) by a Focused Ion Beam (FIB) which allowed us to precisely control its geometry factor L/A = 0.89 1/μm. The FIB was also used to deposit 4 Pt contacts. We found a slope of $\mathbf{H}_{c2,50\%}$ (T), parallel to the c-axis, of 1.9 T/K for $SmFeAs(O_{0.7}F_{0.25})$ and 3.7 T/K for $(Ba,Rb)Fe_2As_2$ near T_c. The electronic anisotropy, derived from magneto-transport, is significantly larger in the REFeAs(OF) crystals than in $(Ba,Rb)Fe_2As_2$.

Philip Moll
Laboratory for Solid State Physics, ETH Zurich, Switzerland

Date submitted: 21 Nov 2008 Electronic form version 1.4