Transport and torque magnetometry measurements on CeAuSb$_2$

LISHAN ZHAO, Max Planck Institute for Chemical Physics of Solids, Dresden, 01069, Germany, EDWARD YELLAND, University of St Andrews, Fife, KY16 9SS, UK, JAN BRUIN, High Field Magnet Laboratory, Toernooiveld 7, 6525ED Nijmegen, the Netherlands, HIDE SAKAI, Department of Applied Physics, School of Engineering, University of Tokyo, 7-3-1 Hongo Bunkyo-ku, Tokyo 113-8656 Japan, ILYA SHEIKIN, LNCMI-Grenoble (Grenoble High Magnetic Field Laboratory), CNRS, Grenoble, France, ANDREW MACKENZIE, Max Planck Institute for Chemical Physics of Solids, Dresden, 01069, Germany — The tetragonal crystal CeAuSb$_2$ has a layered structure and orders antiferromagnetically at $T \sim 6$K. Under a c-axis magnetic field, the Neel temperature is gradually suppressed to zero at a possible field-tuned quantum critical point at about 6 T. Within this antiferromagnetic phase, between the QCP and about 2.8 T, there is an additional, novel phase. We report transport measurements on pure single crystals of CeAuSb$_2$, in fields of up to 35 T and from room temperature down to 100 mK. We also report torque magnetometry measurements. Unlike a recent report, we find single, sharp transitions into the novel phase. We discuss the nature of the novel phase.

The work presented is supported by TOPNES (Topological Protection and Non-Equilibrium States in Strongly Correlated Electron Systems research programme), the Engineering and Physical Sciences Research Council (EPSRC, UK) and Max Planck Institute for Chemical Physics of Solids (Dresden, Germany) etc.

Lishan Zhao
Max Planck Institute for Chemical Physics of Solids,
Dresden, 01069, Germany