**High Field Magnetization of USb Single Crystals**

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**Introduction**

Motivated by our recent discoveries in UO2 [1] we propose to perform extensive high field magnetization measurements of uranium monopnictide USb. It crystallizes in the cubic NaCl-type crystal structure, and is known to order antiferromagnetically, with a triple-k magnetic structure with a wave vector (1,0,0), below T­N = 213 K [2, 3]. In addition, a very low Sommerferld coefficient has been found in this material [4] questioning delocalized nature of 5f-electrons in this uranium metallic system. Here we propose to perform detailed magnetization measurements of high quality single crystals of USb at pulsed magnetic fields up to 65 T. These measurements will reveal the nature in magnetism and energy scales that are important in this material.

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**Experimental**

Magnetisation measurements in pulsed magnetic fields up to 60 T were measured using a pickup-coil technique at NHMFL, Los Alamos. A USb single crystal was enclosed in a capsule and placed directly inside the pickup coils. The measurements were done by applying pulsed magnetic fields when the sample was moved in and out of the pickup coils. The difference in response of the two positions gives the magnetization of the measures samples. This technique is also known as “extraction magnetometry”.

**Results and Discussion**

Figure 1 shows field dependencies of the magnetization of USb crystals obtained at 4 K. The measurements have been performed in the magnetic field applied along <100> and <110> crystallographic direction. As seen, at 35 T the magnetization reaches a value ~0.2 B which is about 10 times smaller than ordered magnetic moment obtained from the neutron measurements [5].

**Figure 1** The magnetic field dependence of the magnetization of USb crystal measured at T = 4 K. The measurements have been performed in magnetic field applied along <100> and <110> crystallographic directions.

**Acknowledgements**

A portion of this work was performed at the National High Magnetic Field Laboratory, which is supported by National Science Foundation Cooperative Agreement No. DMR-1157490 and the State of Florida. KG and KS acknowledge support from US DOE Early Career research program.

**References**

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