

Abstract Submitted  
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**Magnetoresistance and Hall Effect studies on  $\text{SmB}_6$  films**<sup>1</sup> JIE YONG, YEPING JIANG, XIAOHANG ZHANG, JONGMOON SHIN, Univ of Maryland-College Park, BRIAN KIRBY, Center for Neutron Research, National Institute of Standards and Technology, ICHIRO TAKEUCHI, RICHARD GREENE, Univ of Maryland-College Park — We report magnetoresistance and Hall effect measurements on co-sputtered nanocrystalline  $\text{SmB}_6$  films up to 9T. The magnetoresistance (MR) at 2K is linearly positive at low field and becomes negative at higher field. The unusual positive MR is similar to observations in other non-correlated topological insulators. The Hall coefficient  $R_H$  shows a sign change from negative to positive around 50K upon cooling.  $R_H$  peaks and becomes nonlinear in field around 10K then tend to saturate in value below 10K. Two samples with different geometries (thickness and lateral dimensions) show contrasting behaviors below and above 50K, which indicates a surface origin of the low temperature carriers. We will also present XPS and PNR (polarized neutron reflectometry) results in an attempt to better understand the mysterious surface magnetism that gives hysteretic behavior in some low temperature transport measurements.

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