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Giant magnetoresistance and band structure of topological semimetal RhSb3 KEFENG WANG, LIMIN WANG, Y. NAKAJIMA, RENXIONG WANG, JIE YONG, J. PAGLIONE, Center for Nanophysics and Advanced Materials, Department of Physics, University of Maryland College Park — Recently materials with skutterudite structure such as CoSb3 were predicted to provide a promising platform for the realization of new topological materials such as topological insulators and Dirac-Weyl semimetals. Here we report a detailed study of the electronic structure and magnetotransport properties of high quality RhSb3 single crystals. First-principles electronic structure calculations reveal a highly dispersive band with Sb-p and Rh-3d weight that shows apparent band inversion. Inclusion of spin-orbit coupling leaves the Fermi level pinned to a doublet, indicating a topological semimetal. Our synthesized high-quality single crystals show typical metallic behavior but with very small residual resistivity ratio, a sign of semimetal behavior, in zero field. We will present magnetotrasport data that exhibits a very large magnetoresistance that hints of a very sensitive evolution of electronic properties and Dirac-like spectrum.

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