Title:	Discovery of highly spin-polarized conducting surface states in the strong spin-orbit coupling semiconductor Sb 2 Se 3
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Abstract:	Majority of the A2B3-type chalcogenide systems with strong spin-orbit coupling (SOC), such as Bi2Se3,Bi2Te3, and Sb2Te3, etc., are topological insulators. One important exception is Sb2Se3 where a topological nontrivial phase was argued to be possible under ambient conditions, but such a phase could be detected to exist only under pressure. In this paper, we show that Sb2Se3 like Bi2Se3 displays a generation of highly spin-polarized current under mesoscopic superconducting point contacts as measured by point-contact Andreev reflection spectroscopy. In addition, we observe a large negative and anisotropic magnetoresistance of the mesoscopic metallic point contacts formed on Sb2Se3. Our band-structure calculations confirm the trivial nature of Sb2Se3 crystals and reveal two trivial surface states one of which shows large spin splitting due to Rashba-type SOC. The observed high spin polarization and related phenomena in Sb2Se3 can be attributed to this spin splitting.
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