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Robust surface states in epitaxial Bi(111) thin films KAI ZHU, XIAOFENG JIN, Physics department of Fudan University — Bulk Bi a prototype semimetal with trivial electronic band topology. Unanticipatedly, we show the Altshuler-Aronov-Spivak and Aharonov-Bohm effects in epitaxial Bi(111) thin films. Meanwhile, we clearly identify the interaction of the top and bottom surface states via quantum tunneling by the electrical conductance and weak anti-localization measurements. These results have significantly enriched our understanding about the electronic structure of Bi, which might be helpful for clearing up some of its long-standing subtle issues.

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