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Image potential states in the topological semimetal Sb[1] YAU CHUEN YAM, YANG HE, PENGCHENG CHEN, ZHIHUAI ZHU, MOHAMMAD HAMIDIAN, Harvard Univeristy, MARCEL FRANZ, University of British Columbia, JENNIFER HOFFMAN, Harvard Univeristy, HOFFMAN LAB TEAM, MARCEL FRANZ COLLABORATION — Topological materials host protected surface states with locked spin and momentum degrees of freedom that have been predicted to give rise to several exotic excitations such as Majorana fermions and magnetic monopoles. The topological semimetal antimony (Sb) offers a pristine platform in which to search for these excitations. Here we present scanning tunneling microscopy and spectroscopy studies of Sb at high energy where quantized image potential states form due to the binding between the tunneling electron and the polarized surface. These states allow exploration of the image charge geometry necessary to realize a magnetic monopole.

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