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**Probing Dirac Fermions in Bi-based Semimetals
by Cryomagnetic Scanning Tunneling and Point Contact
Spectroscopy¹**

J.Y.T. WEI, University of Toronto and Canadian Institute for Advanced Research, I. FRIDMAN, Y.T. YEN, University of Toronto, HECHANG LEI, KEFENG WANG, C. PETROVIC, Brookhaven National Laboratory — The topological semimetal Bi_2Se_3 is distinguished by the presence of two-dimensional Dirac fermions with strong spin-orbit coupling. The linear dispersion of Dirac fermions in Bi_2Se_3 was recently observed by scanning tunneling spectroscopy measurements of the Landau level spacing versus magnetic field. In this work we extend the field-dependent spectroscopy study of Dirac fermions to other Bi-based semimetals, for both topological and non-topological cases, using cryomagnetic scanning tunneling and point contact probes on single crystals down to 300 mK and up to 9 T. The spectral dependences on field strength and field direction are examined, in an effort to elucidate the role of spin-orbit coupling in each case.

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John Y. T. Wei

wei@physics.utoronto.ca

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