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**Band structure of topological insulators from noise measurements in tunnel junctions** JUAN PEDRO CASCALES SANDOVAL, Massachusetts Institute of Technology, ISIDORO MARTINEZ, Universidad Autnoma de Madrid, RUBEN GUERRERO, IMDEA-Nanociencia, CUI-ZU CHANG, FERHAT KATMIS, JAGADEESH MOODERA, Massachusetts Institute of Technology, FARKHAD ALIEV, Universidad Autnoma de Madrid — The unique properties of spin-polarized surface or edge states in topological insulators (TIs) make these quantum coherent systems interesting from the point of view of both fundamental physics and their implementation in low power spintronic devices. Here we present such a study in TIs, through tunnelling and noise spectroscopy utilizing TI/Al2O3/Co tunnel junctions with bottom TI electrodes of either Bi2Te3 or Bi2Se3. We demonstrate that features related to the band structure of the TI materials show up in the tunnelling conductance and even more clearly through low frequency noise measurements. The bias dependence of 1/f noise reveals peaks at specific energies corresponding to band structure features of the TI. TI tunnel junctions could thus simplify the study of the properties of such quantum coherent systems that can further lead to the manipulation of their spin-polarized properties for technological purposes.

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