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Modeling electron dynamics at the topological insulator-metal interface SUSMITA BASAK, HSIN LIN, Northeastern University, SU-YANG XU, M. Z. HASAN, Princeton University, ARUN BANSIL, Northeastern University — The surface environment of the topological insulators possesses ideal properties such as spin-polarized conductivity and suppressed scattering for advanced electronics applications. A major key missing ingredient in this connection is lack of understanding of how topologically ordered electrons respond to the presence of interfaces and various surface terminations that constitute device components at the nanometer scale. To explore these issues we have developed a Green's function implementation of the $k \cdot p$ model to numerically simulate junctions and surfaces of topological insulator Bi_2Se_3 based on experimentally measured bulk electron kinetics. Our model explains a number of interesting features observed in ARPES experiments for surface deposition in Bi_2Se_3.

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