

Abstract Submitted
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Transfer Matrix Method for Optical Calculations of Multilayered Topological Insulators¹ ANG CHEN, Fudan Univ, LIXIN GE, Chongqing Univ, YUNYUN DAI, LEI SHI, XIAOHAN LIU, Fudan Univ, DEZHUAN HAN, Chongqing Univ, JIAN ZI, Fudan Univ, DEPARTMENT OF PHYSICS, FUDAN UNIVERSITY, CHINA COLLABORATION, DEPARTMENT OF APPLIED PHYSICS, CHONGQING UNIVERSITY, CHINA COLLABORATION — Owing to a topological magneto-electric effect, topological insulators (TIs) show unusual electromagnetic response. As a result, TI films and multilayers possess many interesting and unique optical properties which could offer many important potential applications in designing new functional devices. An efficient method for optical calculations on TI multilayers is thus highly desired. Here, a 4×4 transfer matrix method is developed for optical calculations in layered media consisting of TIs. With the framework of this method, optical properties such as reflection and transmission, and magneto-optical effects such as Kerr and Faraday rotations for different TI-layers are calculated. Unusual photonic band structures and band gaps in TI photonic crystals are also revealed.

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