Optical Signatures of Topological Insulators\textsuperscript{1} MING-CHE CHANG, National Taiwan Normal Univ., Taipei, Taiwan, MIN-FONG YANG, Tunghai University, Taichung, Taiwan — The axion coupling in topological insulators couples electric polarization with magnetic field, and magnetization with electric field. As a result, the usual laws of electromagnetic wave propagation are modified. We report on the Fresnel formula for the reflection of electromagnetic wave at the interface of materials with different axion couplings. The Brewster angle and the Goos-Hänchen effect are also studied. We find that, because of the axion coupling, in order to realize the Brewster-angle condition, the incident polarization should be rotated away from the plane of incidence. The maximum angle of rotation is \( \pi/4 \) when both materials have nearly the same refraction indices. This offers a convenient way to determine the axion angle by optical measurement.

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