

Abstract Submitted
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Giant Kerr Effect and Universal Faraday Effect in Thin-film Topological Insulators¹ WANG-KONG TSE, A. H. MACDONALD, University of Texas, Austin — Topological insulators display a novel magneto-electric coupling due to the presence of gapless surface states. In this talk, we present our study on the Kerr and Faraday effects of thin-film topological insulators in the presence of time-reversal symmetry breaking. We find that the low-frequency Faraday rotation is universal completely determined by the fine structure constant $\alpha = e^2/\hbar c = 1/137$. Moreover, we predict a giant infrared Kerr rotation due to the interplay of thin-film cavity confinement and topological surface Hall conductivity of helical quasiparticles.

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