

Abstract Submitted  
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**Electromagnetic Response of Three-dimensional Topological Crystalline Insulators**<sup>1</sup> SRINIDHI RAMAMURTHY, YUXUAN WANG, TAYLOR HUGHES, University of Illinois at Urbana-Champaign — Topological crystalline insulators (TCI) are a new class of materials which have metallic surface states on select surfaces due to point group crystalline symmetries. In this letter, we consider a model for a three-dimensional (3D) topological crystalline insulator with Dirac nodes occurring on a surface that are protected by the mirror and time reversal symmetry. We demonstrate that the electromagnetic response for such a system is characterized by a 1-form  $b_\mu$ .  $b_\mu$  can be inferred from the locations of the surface Dirac nodes in energy-momentum space. From both the effective action and analytical band structure calculations, we show that the vortex core of  $\vec{b}$  or a domain wall of a component of  $\vec{b}$  can trap surface charges.

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