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**Magnetic field control of Weyl node population in $Pb_{1-x}Sn_xTe$**[1]
NICHOLAS KIOUSSIS, JINWOONG KIM, California State University, Northridge, TIAN LIANG, N. P. ONG, Princeton University — For materials possessing topological phase transition, the Weyl semimetal phase can be induced by breaking either the time-reversal or inversion symmetry. The topological crystalline insulator, $Pb_{1-x}Sn_xTe$ exhibits topological phase transition upon the band inversion strength which can be tailored by the substitutional mixing ratio, strain, thermal expansion, ferroelectric displacement, and/or material thickness via quantum confinement effect. The SnTe building block of the compound is also known to exhibit a ferroelectric transition at low temperatures which leads to inversion symmetry breakdown. Therefore one can expect that $Pb_{1-x}Sn_xTe$ exhibits diverse topological phases including a Weyl semimetal phase. In this study, using *ab-initio*-tight-binding calculations we have explored the parameter space associated with both band inversion and ferroelectric displacement. The calculated topological phase diagram shows the emergence of a Weyl semimetal phase. We will also present results of the evolution of Weyl nodes with magnetic field.

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