

Abstract Submitted  
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**Plasmon mode as a detection of the chiral anomaly in 3D Weyl semimetals**<sup>1</sup> JIANHUI ZHOU, Carnegie Mellon Univ, HAO-RAN CHANG, Sichuan Normal University, Chengdu, China, DI XIAO, Carnegie Mellon Univ — Weyl semimetals (SMs) are one kind of three-dimensional gapless SMs with nontrivial topology in the momentum space. The chiral anomaly in Weyl SMs manifests as a charge imbalance between the Weyl nodes of opposite chiralities induced by parallel electric and magnetic fields. We investigate the chiral anomaly effect on the plasmon mode in Weyl SMs within the RPA. We prove that the chiral anomaly gives rise to a new plasmon mode in intrinsic Weyl SMs. The chiral anomaly leads to some exotic properties in the plasmon dispersion in doped Weyl SMs. Consequently, the unconventional plasmon mode acts as a signature of the chiral anomaly in Weyl SMs, by which the spectrum of plasmon provides a proper way to detect the Lifshitz transition. Our work sheds light on the probing of the chiral anomaly in 3D Weyl SMs via the plasmon mode. The tunability of plasmons due to the chiral anomaly also makes Weyl SMs promising candidates for plasmonics. Reference: arXiv:1408.4876

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