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Chiral Anomaly and Second Harmonic Generation in Weyl Semimetals ALEXANDER ZYUZIN, Royal Institute of Technology, A.YU. ZYUZIN, Ioffe Physico-Technical Institute — We study second harmonic generation in centrosymmetric Weyl semimetal with broken time reversal symmetry. We calculate electric current density at the double frequency of propagating electromagnetic field in the presence of applied constant magnetic field, using the method of kinetic equation for electron distribution function. We remind that second harmonic generation in systems with inversion centre requires incident radiation with finite wave-vector, while propagating electromagnetic wave with transverse polarization can not lead to the chiral anomaly. We show that applying a constant magnetic field in addition to propagating electromagnetic wave gives rise to the observable contribution of the chiral anomaly to second harmonic generation. It is shown that the chiral anomaly contribution to second harmonic generation in the lowest order is linearly proportional to the applied magnetic field. The limit when the chiral anomaly dominates over the Lorentz-type contribution to second harmonic generation is discussed.

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