

Chiral Magnetic Effect in QED induced by longitudinal photons

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We demonstrate the existence of the chiral magnetic effect in an electron-positron magnetized gas. A pseudo-vector (conserved) Ohm current is induced by the electric field related to the longitudinal QED mode propagating parallel to the external magnetic field and separating opposite charges of the same helicity. From a relation between axial and electromagnetic currents we obtain a non-conserved current leading to an expression close to the usual axial anomaly. The effect is interesting in connection to the QCD chiral magnetic case reported in current literature.

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