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# Chiral Magnetic Effect in Weyl semimetals: the interplay of the bulk and the boundary

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## Abstract

Weyl semimetals provide us an outstanding platform to probe the properties of three-dimensional relativistic massless electrons in condensed-matter setup. One of the theoretical predictions for such excitations that goes back to 1980 is the so-called Chiral Magnetic Effect. This effect lies in appearance of electric current proportional to the external magnetic field, but is known to vanish in thermal equilibrium. A simple and yet experimentally accessible way to probe the effect is to drive the system out of equilibrium is to make the magnetic field time-dependent. We attempt to resolve the controversy present in the literature regarding the value of the coefficient entering the expression for the current, and to clarify the contributions of the bulk and the boundary states therein. We confirm a recent surprising finding of [1] that the boundary states may dominate the current, and that their contribution survives in the limit of large sample sizes. At the same time, we find that the value of the coefficient is non-universal.

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