Chirality-Induced Spin Polarization in Chiral Crystals

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Keywords: Chirality, Spin polarization, Macroscopic spin response

A role of chirality in materials is discussed in terms of an emergence of macroscopic spin response, being inspired by recent works on chiral magnetism and chirality-induced spin polarization. These viewpoints may bring us to a new frontier of chiral material science. In this connection, we will focus the experimental findings that chiral materials exhibit a spin-polarized state when the charge current is injected into them [1-4]. A spin-polarized transport occurs in a linear regime of the current-voltage characteristics. Importantly, a robust protection of the spin polarization enables a nonlocal spin transport over micrometers or longer. A comprehensive understanding of these nontrivial spin response remains an important issue and may clarify the interplay between structural and dynamical chirality. This work was done in collaboration with the laboratory members in OPU. I sincerely appreciate their great efforts on performing experiments.

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