Exploiting altermagnets for sustainable electronics

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Altermagnets emerge as a novel type of compensated collinear magnets that complement the conventional classes of ferro- and antiferromagnets [1,2]. In contrast to antiferromagnets, for which the opposite sublattices are connected by simple lattice translation or inversion, in altermagnets, they are connected by a lattice rotational symmetry (symmorphic/non-symmoprhic, proper/improper) [1,2]. This causes time reversal symmetry breaking in the band structure and – in contrast to ferromagnets – a spin splitting that alternates in sign within the Brillouin zone motivating the term altermagnetism. The magnetization, however, integrates to zero over the entire Brillouin zone. Here we show experimental verification of the spin-splitting by angle resolved photo emission spectroscopy investigations [3] and outline why these materials are causing so much attention in research [4, 5] of future materials for electronics.

References

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