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Electrical transport in three-dimensional cubic Skyrmion crystal XIAO-XIAO ZHANG, Univ of Tokyo, NAOTO NAGAOSA, Univ of Tokyo and RIKEN CEMS — Two-dimensional magnetic Skyrmions have been well confirmed via various experimental techniques in the bulk or on epitaxial thin films. Besides, a topologically nontrivial three-dimensional cubic Skyrmion crystal in the bulk, which is essentially a hedgehog-antihedgehog pair texture predicted theoretically, has also been tentatively observed. Equipped with a sophisticated spectral analysis program, we adopt Matsubara Green's function technique to study electrical transport, especially diagonal conductivity, in such system. We consider conduction electrons interacting with spinwaves via the strong Hund's rule coupling, wherein fluctuation of monopolar emergent electromagnetic field exits within adiabatic approximation. We describe in detail the influence of temperature and Skyrmion number on both dc and ac conductivities. Possible deviation from Fermi liquid behavior will also be discussed.

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