Abstract Submitted
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Magnon spin texture in momentum space[1] NOBUYUKI OKUMA, Department of Physics, University of Tokyo — A Magnon plays a central role in recent spintronics. In a ferromagnet, magnons are bosons with spin 1, and the current of the magnons can be interpreted as a spin current. More recently, magnons in other magnetic structures such as antiferromagnets have attracted much attention and been expected to have new properties. In this study, we consider the momentum-dependence of magnon spin moment. In some electron systems such as a topological insulator surface state, electron spin moment depends on the electron momentum (spin-momentum locking). We generalize the notion of the momentum-dependence of spin moment to the magnonic systems. We define the momentum-dependent spin for general magnon Hamiltonians. As an example, we consider the magnon spin texture in momentum space for a kagome lattice antiferromagnet. When the system has arotational symmetry, spin moment has no momentum-dependence since spin is a good quantum number. To break the rotational symmetry, we consider the Dzyaloshinskii-Moriya term, which plays an important role in a realized kagome lattice antiferromagnet, adding to the Heisenberg Hamiltonian. Using the definition, we obtain three magnon bands: two dispersive bands with and without spin texture, and the flat band with spin texture.

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