

New excitations in Spintronics



Contribution ID: 12

Type: **not specified**

Magnon-pair excitation and transport in spin nematics

In ordinary magnetic insulators, elementary excitation from a magnetic ordered state is described by a magnon, which is a quantized spin wave. Magnons carry spin current and thermal current. In contrast, frustrated quantum magnets frequently exhibit non-trivial ground states and elementary excitations. Thus we expect that novel types of carriers would contribute to spin and thermal transport phenomena. Here we focus on a spin nematic state in a spin-1/2 frustrated ferromagnetic chain. In the spin nematic state, low-energy excitations are governed by bound magnon pairs, so that bound magnon pairs carry spin current and thermal current. In the present work, we investigate transport properties by exploiting numerical methods, such as exact diagonalization and density-matrix renormalization group. We argue that bound magnon pairs would contribute to the spin transport, based on numerical results of current-current correlation functions.

Primary author: Dr ONISHI, Hiroaki (Advanced Science Research Center, Japan Atomic Energy Agency)

Presenter: Dr ONISHI, Hiroaki (Advanced Science Research Center, Japan Atomic Energy Agency)