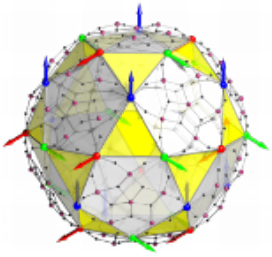

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Temporal evolution of magnon-magnon interaction in a magnetic vortex

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Brillouin light scattering microscopy (TR-µBLS) measurements on a Permalloy disk magnetized in the vortex state are presented. By applying a homogenous out-of-plane AC field with sufficiently large amplitudes it is possible to drive the spin waves in the nonlinear regime and initiate three- and four-magnon scattering processes.

Time resolved µBLS is used to show that these pumping conditions cause cascades of different types of magnon-magnon interactions. It is shown, that the temporal transition of different scattering mechanisms can be tuned by the excitation frequency and amplitude.

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