

SPIN WAVES IN MAGNETIC RINGS: LINEAR AND NONLINEAR PROPERTIES, NON-LOCAL DAMPING

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Magnetic rings are an excellent testing ground to study a wide richness of spin-wave phenomena ranging from propagation of spin waves, formation of several classes of spin-wave eigen-modes, and localized spin waves, up to effects of spatial and temporal coherency and non-local dissipation by nonlinear mode coupling. I will give an introduction into the fundamental properties of magnetization dynamics in small magnetic rings and then address these spin-wave phenomena. The systems studied are permalloy rings with diameters ranging between 1 and 3 micrometer. The method of spin-wave observation is time resolved Brillouin light scattering (BLS) microscopy allowing an optical resolution down to 250 nm. BLS images will be used to understand the underlying physical principles of the magnetization dynamics.