Magnon dynamics in iron-garnets excited by a train of femtosecond laser pulses

Abstract:
In our work we identify novel features of the periodic optical excitation of magnons. We excite magnetization of iron-garnet film by a sequence of circularly polarized laser pulses at high repetition rate so that interval between pulses is shorter than the decay time of the oscillations. As a result, magnons are generated in a specific narrow range of wavenumbers. We show that such excitation method provides some valuable features: enhancement of magnetization oscillation amplitude, increasing of spin waves propagation range and significant level of spin waves wavelength tunability.