

BEC of magnons at room temperature and spatio-temporal properties of magnon condensate

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Magnons are the quanta of magnetic excitations in a magnetically ordered media. In thermal equilibrium, they can be considered as a gas of quasiparticles obeying the Bose-Einstein statistics with zero chemical potential and a temperature dependent density. We will discuss the room-temperature kinetics and thermodynamics of the magnons gas in yttrium iron garnet films driven by a microwave pumping and investigated by means of the Brillouin light scattering spectroscopy. We show that the thermalization of the driven gas results in a quasi-equilibrium state described the Bose-Einstein statistics with a non-zero chemical potential, the latter being dependent on the pumping power. For high enough pumping powers Bose-Einstein condensation (BEC) of magnons can be experimentally achieved at room temperature. Spatio-temporal kinetics of the BEC-condensate will be discussed in detail. Among others interference of two condensates, vortices, and propagating waves of the condensate density will be addressed.