

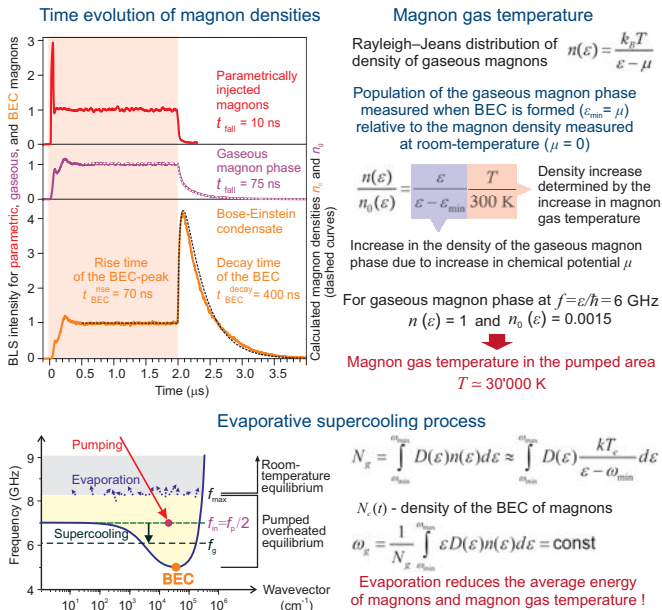
Subproject B: Coherent interactions and phase transitions in magnon gases and condensates

Aims

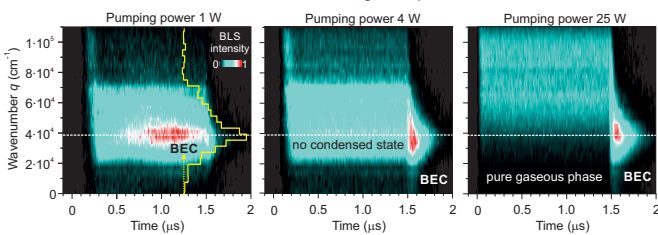
1. Manipulation of magnon condensates by thermally and electrically induced non-equilibrium magnetic moments
2. Role of phonon-, magnon- and electron interactions in the establishing of coherent dynamics in quasi-particle gases
 - Influence of electron carried spin currents on the BEC in magnetic | non-magnetic hybrid structures
 - Spin-Seebeck effect induced magnon condensation
 - Coherent interactions and particle transfer between magnon and magnon-phonon condensates
 - Magnon BECs at low temperatures: Dependence of condensation scenarios on efficiencies of magnon-magnon and magnon-phonon scattering
 - Magnon-photon condensation in perpendicularly magnetized magnetic films

Achievements

Transitional dynamics of pumping free BEC of magnons: Overheated magnon gas and evaporative super-cooling

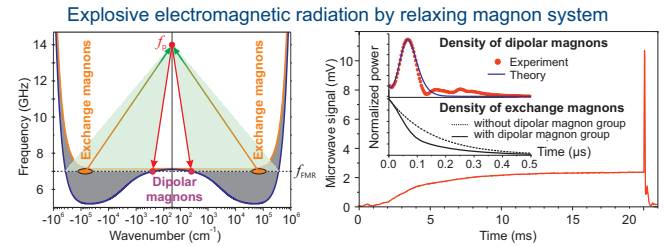


Evolution of gaseous magnons and magnon BEC in a phase space at the bottom of magnon spectrum

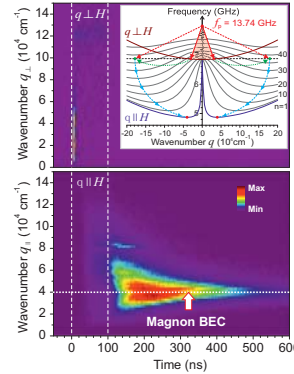


Achievements

Thermalization scenarios of parametrically driven magnon gas

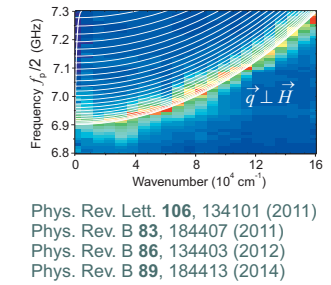


Simulated thermalization



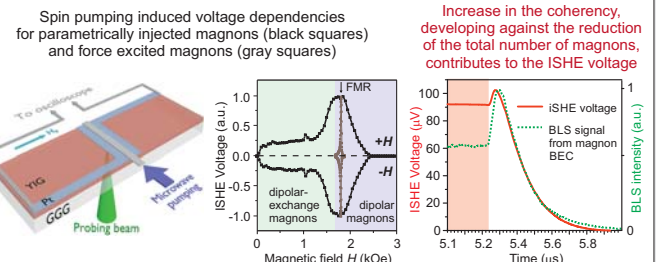
Spectral and decay characteristics of a magnon gas

Spectra of parametric magnons



Preliminary Work

Electric voltage in a Pt|YIG bi-layer created by parametric magnons and by the magnon BEC



Role within the SFB / TR 49

- A8** Theoretical support will be provided by subproject (a) of project A8 (Kopietz), where the magnon distributions will be calculated microscopically.
- A5** The analysis of transient processes in boson condensates will be performed in cooperation with project A5 (Fleischhauer).
- B1** Temperature dependent behaviour of BEC of magnons will be analyzed in comparison with quantum spin systems studied in project B1 (Wolf/Lang).

