AFMR in noncollinear antiferromagnet $Mn_3Al_2Ge_3O_{12}$.

Yulia Krasnikova[1,2], Vasiliy Glazkov[1,2], Timofey Soldatov[3]

[1]P. L. Kapitza Institute for Physical Problems RAS, Moscow, Russia

[2] National Research University Higher School of Economics, Moscow, Russia

[3] Moscow Institute of Physics and Technology, Dolgoprudny, Russia

Various magnetic garnet are actively studying for decades. The most popular is YIG (yttrium iron oxide), which has applications in UHF techniques [1], other garnets are used for magnetic cooling [2]. Unusual magnatic properties are partially due to frustration of exchange bonds. Garnet $Mn_3Al_2Ge_3O_{12}$ orders antifferomagnetically at T_N=6.5 K into complicated 12 sublittices noncollinear structure [3].

We have studied low energy dynamics of this ordered structure by means of antiferromagnetic resonance (AFMR). Experiments were performed at T=1.8 K, f=1-120 GHz, H=0-6 T. Representative f(H) diagram for H||[100] is shown in Figure 1. Experimental data were described by Andreev-Marchenko theory [4] using numerical modelling [5]. Additionally we have detected hysteresis of AFMR absorption connected with antiferromagnetic domains (Figure 2.). More detailed analysis of AFMR in $Mn_3Al_2Ge_3O_{12}$ is reported in [6].

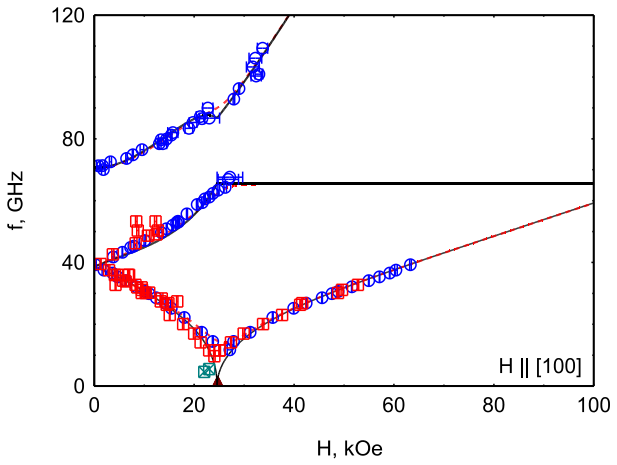

Figure 1. AFMR f(H) dependence at **H**||[100], T=1.8 K. Solid lines - numeric calculations.

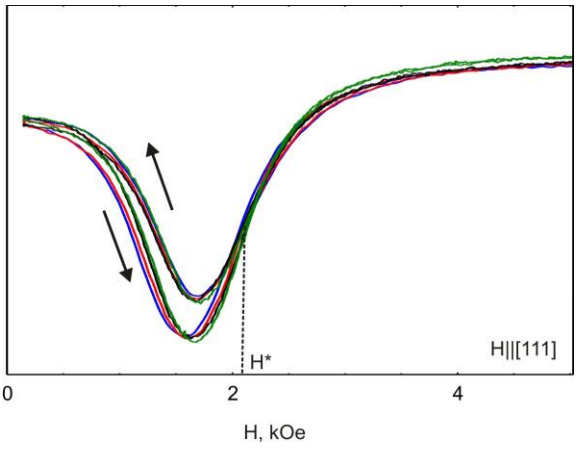

Figure 2. Hysteresis of AFMR signal. Arrows - field sweep direction. **H**||[111], f=37.6 GHz, T=1.8 K. *H** - field of monodomenization.

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