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Magnetic diffuse scattering in Tb₃Ga₅O₁₂ and Tb₃Al₅O₁₂ garnets KAZUYA KAMAZAWA, Dept. of Phys., Univ. of Virginia, TAKU SATO, ISSP, Univ. of Tokyo, DESPINA LOUCA, Dept. of Phys., Univ. of Virginia — In geometrically frustrated systems, long-range magnetic ordering is usually suppressed down to very low temperatures. While in the so-called spin liquid phase, magnetic diffuse scattering is observed. The physical origin of such scattering is not well understood. Using neutron scattering and DC, AC magnetic susceptibility measurements on Tb₃Ga₅O₁₂ and Tb₃Al₅O₁₂, we observed magnetic diffuse scattering and unusual paramagnetic behavior. The M-T curve at high magnetic field does not coincide with the one at low fields below ~ 10 K. This indicates that magnetic correlations are gradually developing around that temperature. The nonlinear response of the AC susceptibility suggests that the diffuse scattering may originate from critical scattering, which has also been observed in frustrated spinel systems. This might indicate the realization of soft (magnon) modes in the spin liquid phase.

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