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Magnetization of rare earth kagome systems in pulsed fields MICHAEL HOCH, National high Magnetic Field Laboratory, EUN MUN, NEIL HARRISON, NHMFL-LANL, HAIDONG ZHOU, University of Tennessee — The rare earth kagome systems $R_3Ga_5SiO_{14}$ (R = Nd or Pr) exhibit cooperative paramagnetism at low temperatures. Evidence for correlated spin clusters in these weakly frustrated systems has previously been obtained in neutron scattering experiments. The present pulsed field (0 - 60 T) low temperature magnetization measurements on single crystals of $Nd_3Ga_5SiO_{14}$ (NGS) and $Pr_3Ga_5SiO_{14}$ (PGS) have revealed striking differences in the magnetic responses of these two materials. At 1.6 K NGS shows a low field plateau, saturation of the magnetization for $\mu_0 H > 10$ T and significant hysteresis while the PGS magnetization does not saturate in fields up to 60 T and shows no hysteresis or plateaus. While Nd^{3+} (J = 9/2) is a Kramers ion Pr^{3+} (J = 4) is not. The exchange couplings J $\sim$ 1 K are similar for PGS and NGS but the crystal field splittings and anisotropies are quite different. The marked contrast in the behavior of the two kagome systems is attributed to differences in the spin cluster structures and dynamics. The pulsed field approach has great potential for investigating kagome cluster dynamics at low temperatures.

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