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Electron magnetic resonance studies of the $Pr_3Ga_5SiO_{14}$ and $Nd_3Ga_5SiO_{14}$ kagóme systems SANHITA GHOSH, Florida State University, SAITI DATTA, HAIDONG ZHOU, National High Magnetic Field Laboratory, MICHAEL HOCH, STEPHEN HILL, Florida State University — In recent years, there has been considerable interest in materials exhibiting magnetic frustration due to their novel ground state properties. $Pr_3Ga_5SiO_{14}$ (PGS) and $Nd_3Ga_5SiO_{14}$ (NGS) have trigonal crystal structures in which the rare earth ions are arranged in corner sharing triangles to form a distorted kagomé lattice. We report high frequency electron magnetic resonance (EMR) measurements on single crystals of NGS and PGS in order to ascertain the nature of their ground states. Both compounds exhibit extremely rich EMR spectra at low temperatures, with a large number of sharp peaks. For each frequency investigated, the peak positions display a strong, systematic dependence on the temperature. However, the usual paramagnetic resonance frequency/field variation is not observed, with the pattern of peaks varying dramatically from one frequency to the next. We thus conclude that the observed spectra correspond to collective excitations associated with finite size ordered clusters that persist on EMR time scales.

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