

Abstract Submitted
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Geometric Frustration with Disorder NAYOON WOO, DANIEL M. SILEVITCH, THOMAS F. ROSENBAUM, the University of Chicago — We study the effects of Nd doping on the geometrically-frustrated Heisenberg antiferromagnet Gadolinium Gallium Garnet (GGG), using linear and nonlinear ac magnetic susceptibility. Doping levels from 0.1 to 1 percent Nd alleviate the intrinsic frustration of pure GGG and elevate the ordering temperature compared to the pure material. We use nonlinear pump-probe magnetic susceptometry to examine cluster dynamics for both the pure and the doped series. At low frequency (~ 10 Hz), spectral hole burning is possible, indicating the presence of spin clusters with discrete energy levels largely decoupled from the overall spin bath. At kHz, we find a Fano resonance, revealing scattering pathways between spin cluster excitations and the bath. We trace the evolution of this resonance behavior as a function of dopant concentration.

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