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Absence of spin liquid behavior: Magneto-optical study of $Nd_3Ga_5SiO_{14}$[1] T.V. BRINZARI, X.S. XU, J.L. MUSFELDT, University of Tennessee, S. MCGILL, H.D. ZHOU, C.R. WIEBE, National High Magnetic Filed Laboratory — We measured the low-lying crystal field levels of Nd^{3+} in $Nd_3Ga_5SiO_{14}$ via magneto-optical spectroscopy and employed the extracted crystal field energies, magnetic moments, and symmetries to analyze the magnetic properties and test the spin liquid candidacy of this material. The exchange interaction is surprisingly small, a discovery that places severe constraints on models used to describe the ground state of this system. Further, it demonstrates the value of local-probe photo-physical techniques for rare-earth-containing materials where bulk property measurements can be skewed by low-lying electronic structure.

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