

Abstract Submitted
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Study of the Magnetic Structure in Gd₅Ge₄ L. TAN, J.W. KIM, A. KREYSSIG, R. MCQUEENEY, Department of PHYSICS & ASTRONOMY, Iowa State University, Ames IA 50011, D. WERMEILLE, B. SIEVE, A. GOLDMAN, S. BUDKO, THOMAS LOGRASSO, V. PECHARSKY, K. GSCHNEIDNER, D. SCHLAGEL, AMES LABORATORY OF US DOE — Gd₅Ge₄ - Gd₅Si₄ based compounds show promising applications due to magneto-caloric, magneto-strictive, and magneto-resistance properties. Gd₅Ge₄ crystallizes in the orthorhombic space group *Pnma*, and orders antiferromagnetically below the temperature $T_N \sim 127$ K. The details of the magnetic structure, however, have not been determined because of the strong neutron absorption of natural Gd. We have employed X-ray Resonant Magnetic Scattering (XRMS) to elucidate the details of the magnetic structure. The magnetic unit cell is the same as the chemical unit cell. Azimuthal scan of the (0 3 0) magnetic peak indicates that the main magnetic moment component lies along the *c* axis. From the azimuthal scan and the *Q* dependence of the magnetic scattering, all three atomic sites are in the same magnetic space group *Pnm'a*. No clear component of magnetic moment along the *a* direction was seen.

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