

Abstract Submitted
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X-ray resonant magnetic scattering study of the spin-flop transition in Gd_5Ge_4 LIZHI TAN, Iowa State University, SHIBABRATA NANDI, ANDREAS KREYSSIG, SHUANG JIA, ALAN GOLDMAN, ROBERT MCQUEENEY, PAUL CANFIELD, JONATHAN LANG, ZAHIRUL ISLAM, THOMAS LOGRASSO, DEBORAH SCHLAGEL, VITALIJ PECHARSKY, KARL GSCHNEIDNER, DEPARTMENT OF PHYSICS AND ASTRONOMY, IOWA STATE UNIVERSITY TEAM, ADVANCED PHOTON SOURCE, ARGONNE NATIONAL LABORATORY COLLABORATION, AMES LABORATORY, USDOE COLLABORATION, DEPARTMENT OF MATERIALS SCIENCE AND ENGINEERING, IOWA STATE UNIVERSITY TEAM — Gd_5Ge_4 crystallizes in the orthorhombic space group Pnma . Below 127 K the Gd moments order antiferromagnetically in a layered structure with a magnetic unit cell same as the chemical unit cell. The ferromagnetic Gd-rich slabs are stacked antiferromagnetically along b-axis. The magnetic moments are primarily aligned along the c-axis. X-ray resonant magnetic scattering was used to study a fully reversible spin-flop transition in a single crystal Gd_5Ge_4 and to elucidate details of the magnetic structure in the spin-flop phase. The Gd moments at the three Wyckoff sites flop from c-axis antiferromagnetically aligned to a-axis antiferromagnetically aligned in a critical field $H_{sf} = 9$ kOe applied along c-axis at $T = 10$ K. The magnetic space group changes from $\text{Pnm}'a$ to $\text{Pn}'m'a'$ at all three sites.

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