

Abstract Submitted
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Enhancement of positive magnetoresistance at the metamagnetic transition in Tb_5Si_3 E.V. SAMPATHKUMARAN, S. NARAYANA JAMMALA-MADAKA, NIHARIKA MOHAPATRA, Tata Institute of Fundamental Research — It is well-known that, in the antiferromagnetic systems, at the metamagnetic transition field (H_t), negative MR [defined as $\{\rho(H)-\rho(0)\}/\rho(0)$ where ρ is the electrical resistivity] is observed. Here we present evidence for the opposite behavior of MR in an intermetallic compound, viz., Tb_5Si_3 , known to form in Mn_5Si_3 -type hexagonal structure (space group: $\text{P6}_3/\text{mcm}$). We observe a field-induced ferromagnetic transition in the magnetically ordered state ($T_N=69$ K). The key experimental finding is that, below T_N , ρ is dramatically enhanced at all temperatures (resulting in large “positive” MR) at H_t , in sharp contrast to the expectation based on common knowledge. This finding bears significant relevance to electron scattering phenomena in general, and in particular in metamagnetic systems.

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