

Abstract Submitted
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Angular dependent investigation of the metamagnetism in the itinerant ferromagnet $\text{Sr}_4\text{Ru}_3\text{O}_{10}$ by magnetization measurements¹ F. WEICKERT, L. CIVALE, M. JAIME, Los Alamos National Laboratory, Los Alamos, NM 87545, USA, E. CARLESCHI, B.P. DOYLE, A. STRYDOM, University of Johannesburg, Auckland Park 2006, South Africa, R. FITTIPALDI, V. GRANATA, A. VECCHIONE, University of Salerno, Via Giovanni Paolo II, I-84084 Fisciano, Italy, M.B. SALAMON, University of Texas at Dallas, Richardson, TX 75080, Dallas, USA — We report a detailed study of the magnetization as a function of temperature, field and crystallographic angle of $\text{Sr}_4\text{Ru}_3\text{O}_{10}$. The $n=3$ member of the $\text{Sr}_{n+1}\text{Ru}_n\text{O}_{3n+1}$ Ruddlesden-Popper serie exhibits ferromagnetism below 105 K with magnetic moments aligned along the crystallographic c -direction in the tetragonal crystal structure. Metamagnetism is observed at about 2 T below 50 K when a magnetic field is applied in the ab -plane. Our study reveals that the metamagnetic transition splits into two distinct anomalies at very low temperatures. Surprisingly, these anomalies are accompanied by a reduction of the total magnetic moment and large hysteresis. Furthermore, the measurements indicate a shift of both metamagnetic signatures to higher fields by rotating the field from $H \parallel ab$ to $H \parallel c$. This observation is in contrast to previously published data, where a single metamagnetic anomaly splits into two that move simultaneously to higher and lower critical magnetic fields with increasing angle. In the presentation we will discuss the application of different spin reorientation models to our experimental findings.

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