

Abstract Submitted
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Metamagnetism and domain formation in $\text{Sr}_3\text{Ru}_2\text{O}_7$ ANDREW MACKENZIE, RODOLFO BORZI, SANTIAGO GRIGERA, ROBIN PERRY, University of St Andrews, YOSHITERU MAENO, Kyoto University — The bilayer perovskite $\text{Sr}_3\text{Ru}_2\text{O}_7$ offers the possibility of creating a quantum critical point by tuning the end-point of a line of first-order metamagnetic transitions towards zero temperature^{1,2}. In the purest samples, with residual resistivity less than $1 \mu\Omega\text{cm}$, the quantum critical point is not reached, due to a bifurcation of the original first-order phase transition, possibly associated with the formation of a new phase^{3,4}. Here we present the results of new measurements which give strong evidence for the existence of magnetic domains throughout the region of the phase diagram enclosed by the bifurcated transition lines. The effect of these domains on the electrical resistivity can be controlled by varying the relative directions of current and the in-plane component of the applied magnetic field. [1] S.A. Grigera *et al.*, *Science* **294**, 329 (2001). [2] S.A. Grigera *et al.* *Phys. Rev. B* **67**, 214427 (2003). [3] S.A. Grigera *et al.* *Science* **306**, 1155 (2004). [4] A.G. Green *et al.* *Phys. Rev. Lett.* **95**, 086402 (2005).

Andrew Mackenzie
University of St Andrews

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