

Abstract Submitted
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Phase reconstruction near to the two-dimensional ferromagnetic quantum critical point CHRIS PEDDER, London Centre for Nanotechnology & UCL, UNA KARAHASANOVIC, FRANK KRUGER, University of St. Andrews, ANDREW GREEN, London Centre for Nanotechnology & UCL — We study the formation of new phases in two dimensions near to the putative quantum critical point of the itinerant ferromagnet to paramagnet phase transition. In addition to the first order and helimagnetic behaviour found in non-analytic extensions to Hertz-Millis theory [1] and in the quantum order-by-disorder approach [2], we find a small region of spin nematic order. Our approach also admits a concurrent formation of superconducting order. We further study the effect of small deformations from quadratic electron dispersion – as previously found in three dimensions, these enlarge the region of spin nematic order at the expense of spiral order.

[1] D. Belitz, T.R. Kirkpatrick and T. Vojta, *Rev. Mod. Phys.* **77**, 579 (2005),. V. Efremov, J.J. Betouras, A.V. Chubukov *Phys. Rev. B* **77**, 220401(R), (2008)

[2] G. J. Conduit *Phys. Rev. A* **82**, 043604 (2010)

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