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Fluctuation Driven Spirals Near Ferromagnetic Quantum Critical Points in Disordered Electron Systems STEVEN THOMSON, FRANK KRUGER, University of St Andrews, ANDREW G. GREEN, London Centre for Nanotechnology — The magnetic properties of itinerant electron systems represent an area of growing experimental and theoretical interest, particularly the peculiar ordered magnetic phases that can occur at low temperatures. It has previously been shown that the quantum order-by-disorder mechanism predicts a spiral magnetic phase in the vicinity of an itinerant ferromagnetic quantum critical point in three spatial dimensions. Here, we present an analytical model of how both charge and spin disorder affect the formation of this spiral magnetic phase at low temperatures, supplemented by numerical evaluation of the fluctuation corrections to the free energy. We show the effect of disorder on the position of the tricritical point and on the stability of the ordered phases. We further discuss the possibility of a helical spin-glass phase and discuss our findings in the context of recent experiments.

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