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Ising nematic quantum critical point in a metal: a Monte Carlo study[1]

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The Ising nematic quantum critical point (QCP) associated with the zero temperature transition from a symmetric to a nematic *metal* is an exemplar of metallic quantum criticality. We have carried out a minus sign-free quantum Monte Carlo study of this QCP for a two dimensional lattice model with sizes up to 24×24 sites. The system remains non-superconducting down to the lowest accessible temperatures. The results exhibit critical scaling behavior over the accessible ranges of temperature, (imaginary) time, and distance. This scaling behavior has remarkable similarities with recently measured properties of the Fe-based superconductors proximate to their putative nematic QCP.

[1]with Yoni Schattner, Steven A. Kivelson, and Erez Berg