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Quantum Monte Carlo study of the nematic quantum critical point in a metal YONI SCHATTNER, Weizmann Institute of Science, SAMUEL LEDERER, Stanford University, EREZ BERG, Weizmann Institute of Science, STEVEN A. KIVELSON, Stanford University — The coupling of fermions to gapless collective modes can lead to interesting critical phenomena, non-Fermi-liquid behavior and/or superconductivity. As an example for such a system, we present a sign-problem free lattice model of quantum-critical Ising-nematic bosons coupled to fermions in two dimensions. Determinantal Quantum Monte-Carlo simulations show a second order nematic transition at low temperatures. As the transition is approached, we find evidence of non-Fermi-liquid behavior. At the temperature scales accessible to us, we find no traces of superconductivity.

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