Sign problem free quantum Monte Carlo simulations of spin density wave transitions in metals EREZ BERG, Harvard University, MAX METLITSKI, Kavli Institute for Theoretical Physics, University of California, Santa Barbara, SUBIR SACHDEV, Harvard University — We present a version of the spin-fermion model for spin density wave (SDW) transitions in metals, which can be simulated using the determinant quantum Monte Carlo method with no sign problem. The sign problem is eliminated by generalizing the model to include two orbitals which are coupled through the SDW field. The resulting model has a pseudo-time reversal symmetry that guarantees that the minus signs resulting from integrating out the fermions cancel, resulting in a real effective action for the SDW bosonic field. We present preliminary results for the SDW and pairing susceptibilities and the fermion Green's function near the quantum critical point.

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