

Abstract Submitted
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Fermi surface pockets and Luttinger sum rule in low-dimensional systems¹ CHRISTOPHE BERTHOD, THIERRY GIAMARCHI, DPMC, University of Geneva, Switzerland, SILKE BIERMANN, ANTOINE GEORGES, CNRS-UMR, Ecole Polytechnique, France — We investigate the Mott transition in a quasi-one dimensional system of weakly coupled interacting fermionic chains. Within a generalization of dynamic mean field theory, we study by quantum Monte Carlo the evolution of the electron self-energy with increasing inter-chain coupling. Our approach is able to capture the closing of the Mott gap at some critical coupling, and is thus ideally suited to examine the characteristics of the Mott transition in this and similar systems. We find that the transition proceeds through an intermediate phase where the Fermi surface is broken into electron and hole pockets. Although these pockets can be very small, we show that the Luttinger sum rule is obeyed throughout the phase diagram.

¹C. Berthod, T. Giamarchi, S. Biermann, and A. Georges, Phys. Rev. Lett. **97**, 136401 (2006).

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