

Jamming in many-electron systems

B. Gut and D. Baeriswyl

Department of Physics, University of Fribourg, Chemin du musée 3, CH-1700 Fribourg

Metal-insulator transitions due to electron-electron interactions originate mostly in the blocking of states that are instrumental for charge transport. The Mott phenomenon and Wigner crystallization are famous examples of this “quantum jamming”. We have used the Drude weight for delineating the regions in parameter space where the ground state has an itinerant character from those where the system is jammed. The location of the transition – or rather crossover – between the two regions depends sensitively on both interaction strength and electron density. The model of spinless fermions on a one-dimensional lattice is particularly well suited for illustrating this crossover [1]. An interesting question is whether other criteria, such as the formation of local magnetic moments, agree with the conclusions reached on the basis of the Drude weight.

[1] B. Gut and D. Baeriswyl, unpublished.