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Importance of subleading corrections for the Mott critical point[1]
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The interaction-induced metal-insulator transition should be in the Ising universality class. Experiments on layered organic superconductors suggest instead that the observed critical endpoint of the first-order Mott transition in $d = 2$ does not belong to any of the known universality classes for thermal phase transitions. In particular, it is found that $\delta = 2$. Given the quantum nature of the two phases involved in the transition, we use dynamical mean-field theory and a cluster generalization to investigate whether the new exponents could arise as transient quantum behavior preceding the asymptotic critical behavior. In the cluster calculation, a canonical transformation that minimizes the sign problem in continuous-time quantum Monte Carlo calculations allows previously unattainable precision. Our results show that there are important subleading corrections in the mean-field regime that can lead to an *apparent* exponent $\delta = 2$. Experiments on optical lattices could verify our predictions for double occupancy. P. Sémon and A.-M.S. Tremblay, Phys. Rev. B 85, 201101(R)/1-5 (2012).

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