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The time-dependent Gutzwiller approximation[1]

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The time-dependent Gutzwiller Approximation (t-GA) [1,2] is shown to be capable of tracking the off-equilibrium evolution both of coherent quasiparticles and of incoherent Hubbard bands. The method is used to demonstrate that the sharp dynamical crossover observed by time-dependent DMFT in the quench-dynamics of a half-filled Hubbard model can be identified within the t-GA as a genuine dynamical transition separating two distinct physical phases [3]. This result, strictly variational for lattices of infinite coordination number, is intriguing as it actually questions the occurrence of thermalization. Next, we shall present how t-GA works in a multi-band model for V_2O_3 that displays a first-order Mott transition. We shall show that a physically accessible excitation pathway is able to collapse the Mott gap down and drive off-equilibrium the insulator into a metastable metal phase [4].

[1] M. Schiró and M. Fabrizio, Phys. Rev. Lett. **105**, 076401 (2010).
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[3] M. Sandri, M. Schiró and M. Fabrizio, Phys. Rev. B **86**, 075122 (2012).
[4] M. Sandri and M. Fabrizio, arXiv:1410.4442.

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