Abstract Submitted for the MAR12 Meeting of The American Physical Society

**Periodically and almost periodically driven quantum system** LUCA D'ALESSIO, ANATOLI POLKOVNIKOV, Boston University — When a quantum system is driven periodically in time it can display dynamical localization, i.e its energy grows extremely slowly and may saturate at a value smaller than the infinite temperature limit. We show that by making the period of the perturbation longer this phenomenom is destroyed and the energy of the system grows quickly and saturates at the infinite temperature limit. We argue that this process is related to the breaking down of a particular form of perturbation theory (in the duration in of driving) and can be interpreted as a transition from a local to a long-range effective Hamiltonian. We discuss how robust our findings are against small aperiodicity in the driving. We finally discuss how realize this interesting non-equilibrium physics in cold atom experiments.

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Date submitted: 18 Nov 2011

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