# Dynamics of negative temperature hadron formation in repulsive SU(n) Hubbard models

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Repulsive and attractive SU(n) Hubbard models provide a rich platform to simulate the dynamics of hadronic matter and baryo-genesis [1].

We study post quench dynamics in the repulsive $n$-color Fermi-Hubbard model, initialized in a pattern of empty and n-times occupied sites. In any dimension and for any finite interaction, $U > 0$, this state is proven to relax to a negative temperature state. However, while for weak interactions, $U/J \leq 1$, a negative temperature Fermi liquid-like state emerges, for $U/J \geq 1$, quench spectroscopy [2,3] as well as the behavior of time dependent correlation functions reveal the dynamical formation of heavy and strongly interacting composite particles [4].

For $n = 3$, in particular, most of the particles are bound to very heavy spinless 'baryons' (trions), strongly interacting with each other, and a dilute background gas of intermediate mass mobile 'mesons' (doublons) and of light SU(3) fermions. Baryons are found to move diffusively, with a motion generated by collisions with the mesonic background. Similarly rich negative temperature states form for any $n \geq 2$.

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