Density Assisted Tunneling of Fermions in Optical Lattices VITO SCAROLA, Virginia Tech , WENCHAO XU, WILLIAM MORONG, University of Illinois Urbana-Champaign, HOI HUI, Virginia Tech, BRIAN DEMARCO, University of Illinois Urbana-Champaign — The Hubbard model is a simple approximation to interacting particles tunneling in a lattice. Interactions beyond the ordinary Hubbard term can generate unconventional states of matter. We discuss a scheme that uses stimulated Raman transitions of fermions in optical lattices to introduce density assisted tunneling, an interaction that goes beyond the ordinary Hubbard interaction. We model stimulated Raman processes as a way to dynamically generate density assisted tunneling. We compute observables in the ensuing dynamics. We compare the observables with experiments that reveal evidence for density assisted tunneling.

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