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Transient Dynamics of d-wave Superconductors after a Sudden Excitation MARCO SCHIRO, CNRS, FRANCESCO PERONACI, MASSIMO CAPONE, SISSA — Motivated by recent ultrafast pump probe experiments on high-temperature superconductors, we discuss the transient dynamics of a d-wave BCS model after a quantum quench of the interaction parameter. We find that the existence of gap nodes, with the associated nodal quasiparticles, introduces a dissipation channel which makes the dynamics much faster than in the conventional s-wave model. For every value of the quench parameters, the superconducting gap rapidly converges to a stationary value smaller than the one at equilibrium. Using a sudden approximation for the gap dynamics, we find an analytical expression for the reduction of spectral weight close to the nodes, which is in qualitative agreement with recent experiments.

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