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Random phase approximation study of one-dimensional fermions after a quantum quench[1] JARRETT LANCASTER, New York University, THIERRY GIAMARCHI, DPMC-MaNEP, University of Geneva, ADITI MITRA, New York University — The effect of interactions on a system of fermions that are in a nonequilibrium steady state due to a quantum quench is studied employing the random phase approximation. As a result of the quench, the distribution function of the fermions is greatly broadened. This gives rise to an enhanced particle-hole spectrum and overdamped collective modes for attractive interactions between fermions. On the other hand, for repulsive interactions, an undamped mode above the particle-hole continuum survives. The sensitivity of the result to the nature of the nonequilibrium steady state is explored by also considering a quench that produces a current-carrying steady state.

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