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Spin-orbit coupled Fermi gas under sudden quench of Zeeman field LIN DONG, Rice University, YING DONG, Hangzhou Normal University, MING GONG, The Chinese University of Hong Kong, HAN PU, Rice University — Motivated by recent efforts to achieve effective spin-orbit coupling in cold degenerate gases, we study the dynamical response of a spin-orbit coupled Fermi gas after a sudden quench of external Zeeman field. By solving the time-dependent Bogoliubov-de Gennes equation self-consistently, we have found three dynamical phases emerging from the time evolution, characterized by the distinctive long time asymptotic behavior of the order parameter. We further map out the phase diagram for the various dynamical states in the parameter space spanned by the initial and final values of the Zeeman field strength. In certain parameter regimes, the dynamical states possess nontrivial topological properties, manifested by the presence of the zero-energy edge state localized at a confining boundary. We present a detailed characterization of these phases.

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