

# Nonlinear Propagation of Low-Energy Cosmic Rays from Supernova Remnants

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The transport of Galactic cosmic rays (CRs) in the near-source environment is investigated. After release from the accelerator, large gradients in the CR density can trigger the resonant streaming instability, producing Alfvén waves. The scattering on the self generated magnetic turbulence leads to efficient self-confinement of CRs. Various damping processes and their dependence on the phases of the interstellar medium have been modelled. For the first time we consider the interplay of the self-confinement with Coulomb and ionisation losses, which become important for CR energies of a GeV and below as tested by the Voyager probes. While TeV particles are no longer self-confined after a few tens of kyr, the transport of MeV and GeV particles is still inhibited after 1 Myr with significant implications for modelling of Galactic CRs.

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Cosmic rays

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