

The cosmic ray content of superbubbles

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Although most massive stars are thought to live inside clusters giving rise to galactic-scale superbubbles, a complete model of cosmic ray production in these objects is still missing in the literature. I present an attempt to model particles acceleration in these systems including all the relevant physical processes. The acceleration mechanisms taking place in superbubbles differ from that occurring at isolated supernova remnants in several aspects. The presence of a magnetized shell is expected to efficiently confine the particles, which may therefore experience successive reaccelerations at supernovae shocks. The medium is also thought to be highly turbulent, which hardens the particle spectra and make shock acceleration nonlinear. Spectra are further shaped by losses, stellar winds, and the leakage of the interstellar cosmic rays through the superbubble shell. I will discuss typical superbubble spectra and detail the time-dependent emission of these objects.

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Collaboration

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Subcategory

Theoretical Results

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