Synchrotron emission from the cosmic ray driven galactic winds.

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Abstract

I am going to present a new implementation of energy-dependent propagation of CR electrons in PIERNIK MHD code. The overall propagation of cosmic rays is described by Focker-Planck equation, solved together with the system of MHD equations. We assume a piecewise power-law, isotropic CR distribution function and apply a conservative, finite volume-type propagation of CR gas in momentum space. The core algorithm is based on Miniati's (2001) implementation of CR energy spectrum evolution and on our own implementation of anisotropic, magnetic field-aligned diffusion and advection of CRs on a spatial grid. With the new code we study the observable aspects of cosmic rays propagating in the ISM. In our model CR protons produced in supernova remnants drive galactic winds and CR electrons contribute to polarized synchrotron emission in galactic magnetic fields. We analyze synchrotron radio maps at different radio wavelengths.

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