

Where are the pevatrons that form the knee in the spectrum of the cosmic ray nucleon component around 4 PeV?

Wednesday, 28 June 2023 12:15 (15 minutes)

The paper discusses an approach that made it possible to estimate the distance to the nearest pevatrons, which form a break in the spectrum of the cosmic ray nucleon component of about 4 PeV. It is based on the spectra of nucleons and electrons obtained by the authors in the framework of the superdiffusion model of nonclassical CR diffusion, which have a break, on the assumption that nucleons and electrons are accelerated by the same sources and their propagation in an inhomogeneous turbulent galactic medium is characterized by the same diffusion coefficient, and also on the break in the spectrum of the electronic component in the region of 0.9 TeV, established in the DAMPE experiment.

It is shown that pevatrons, which form a break in the spectrum of the cosmic ray nucleon component of about 4 PeV, are located at distances of the order of 1 kpc from the Earth.

Primary author: LAGUTIN, Anatoly (Altai State University)

Co-author: VOLKOV, Nikolay (Altai State University)

Presenter: VOLKOV, Nikolay (Altai State University)

Session Classification: Cosmic rays of very high energies (> 1 PeV)

Track Classification: Cosmic rays of very high energies (> 1 PeV)