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4. High energy cosmic rays (HE-CR I)

Spectrum and fraction of cosmic ray positrons: results of the anomalous diffusion approach

Volkov, Nikolay¹, Lagutin, Anatoly¹ and Tyumentsev, Alexander¹

¹Altai State University, Radiophysics and Theoretical Physics Department

According to standard scenario cosmic ray positrons are injected in the Galaxy only in secondary production. Under these assumptions the positron fraction should decrease when the energy increase. However, new experimental results obtained in the last decade by PAMELA, Fermi-LAT and AMS-02 collaborations contradict to the standard scenario predictions. An excess of positrons in cosmic rays for the energy $E > 10$ GeV in above experiments was found. New results on the spectrum of positrons are stimulated the development of new theoretical models to explain this phenomenon. Some of these models imply the existence of a primary sources of positrons.

The main goal of this report is discuss the possible contribution due to pulsars and other sources to observed positrons spectra. The anomalous diffusion model was implemented to describe the particles propagation from sources in the Galaxy. It is shown a good agreement between our modelling and the experimental data in the whole energy range.