FRACTIONAL DIFFUSION OF COSMIC RAYS

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We consider the propagation of galactic cosmic rays in assumption that interstellar medium is a fractal medium. Anomalous diffusion equation in terms of fractional derivatives is used for describing of cosmic ray propagation. The anomaly in used model results from large free paths ("Levy flights") of particles between galactic inhomogeneities and particles trapping for long periods of time in these inhomogeneities. Asymptotical solution of the anomalous diffusion equation for point instantaneous source with inverse power spectrum relating to supernova bursts is found. It covers both subdiffusive and superdiffusive regimes and is expressed in terms of the stable distributions. Energy dependence of spectral exponent of observed particles in different regimes is discussed.