Contribution ID : **165** Type : **Plenary/section talk**

Generalized compound diffusion model of solar cosmic rays accelerated in corotating interaction region

Tuesday, 11 October 2016 16:00 (15)

We solve the inverse problem of parameter determination for the generalized compound diffusion model from the simulation results [Pucci F. et al. Monthly Notices of the Royal Astron. Soc. (2016) 459, 3, 3395] for particle transport in the turbulent magnetic field (TMF). We find the distribution density p(x) of the parallel free path along a regular TMF component and the parameters of the field line wandering (FLW). Density p(x) has the form of a tempered power law function with an exponent close to 0.5 and the truncation parameter, depending on the Larmor radius, turbulence level, intermittency and width of the inertial interval. Parallel motion is associated with a stochastic process of tempered superdiffusion showing the transition from the Levy stable process to Gaussian one. Perpendicular diffusion is determined by the character of FLW, which is modeled by the fractional Brownian motion with Hurst exponent H> 1/2. The resulting random process is a generalization of the compound diffusion model for particle transport in a quasi-regular magnetic field. We use this model to assess the SCR fluxes accelerated in corotating interaction regions of solar wind and to study anomalous diffusion observed in several experiments.

Primary author(s) : Prof. SIBATOV, Renat (Ulyanovsk State University)

Co-author(s) : Mr. BYZYKCHI, Alexander (Ulyanovsk State University); Prof. UCHAIKIN, Vladimir (Ulyanovsk State University)

Presenter(s) : Mr. BYZYKCHI, Alexander (Ulyanovsk State University)

Session Classification : Cosmic rays - parallel IV

Track Classification : Cosmic rays