Three dimensional model of the sporadic Forbush effect of galactic cosmic rays

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Time-dependent Parker's transport equation is used for the modeling of the sporadic Forbush effect of the galactic cosmic ray intensity. The sporadic Forbush effect of the galactic cosmic ray intensity is shaped with the changeable diffusion coefficient stipulated by time depending structure of the interplanetary magnetic field turbulence. The changes are realized in the vicinity of the interplanetary space where the Forbush effect takes place. The negative correlation is found between the assumed temporal changes of the exponent ν of the power spectral density of the interplanetary magnetic field turbulence and the expected exponent γ of the rigidity spectrum of the sporadic Forbush effect. Theses results are confirmed based on the interplanetary magnetic field, neutron monitors and meson telescopes experimental data. Particularly, the rigidity spectrum of the sporadic Forbush effect determined by neutron monitors and meson telescopes experimental data is hardening (the exponent γ decreases) when the exponent ν of the power spectral density of the interplanetary magnetic field turbulence increases.