

Radiation hazard from galactic cosmic rays: integral multiplicity and coupling function for radiation dose, monitoring and forecasting, 1. For aircrafts in dependence of shielding and airline parameters

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On the basis of cosmic ray (CR) and solar activity (SA) data in the past for more than four solar cycles taking into account the theory of convection-diffusion and drift global modulation of galactic CR in the Heliosphere we determine the parameters of convection-diffusion and drift mechanisms of CR long term variation in dependence of particles energy. By using these results and published regularly elsewhere predictions of expected SA variation we may made prediction of expected in near future long-term CR intensity variation on the Earth and long-term change of radiation environment in the Heliosphere owed by galactic CR. From other hand, we introduce new nominations: integral multiplicity and coupling function for radiation dose inside aircraft caused by galactic CR in dependence of shielding and altitude. By the method of coupling functions we estimate the connection between CR intensity long-term variation and radiation hazard for aircrafts in dependence of altitude, geomagnetic cutoff rigidity and shielding inside aircraft. We show that by this way we may made monitoring and prediction of expected differential (per unit of time) and integral radiation doze for crew, passengers, and electronic systems at any aircraft lines characterized by dependence from several parameters in time: altitude, cutoff rigidity, shielding. We take into account also expected long-term changes in the planetary distribution of cutoff rigidities which also influenced on galactic CR intensity, and through CR – influenced on radiation hazard inside aircraft.