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Ultimate Spectrum of Solar/Stellar Cosmic Rays

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We reconstruct an ultimate spectrum of solar/stellar cosmic rays (SCR) in a given point in the heliosphere (stellar sphere) basing on maximal value of magnetic field strenght in active region and its characteristic linear dimension. An accelerator of given dimensions and magnetic field strengh may accelarate to a finite energy for a given time (a maximal energy of SCR). We will use spectrum of SCR proposed by Syrovatsky (1961) for relativistic and non-relativistic energies normaliszing it to galactic cosmic ray (GCR) intensity at maximal SCR energy. Maximal values of SCR flux propagating in the heliosphere are determined by equilibrium between pressure of interplanetary magnrtic field and dynamic pressure of SCR (Frier&Webber, 1963). The obtained spectra would be applied to explain the extreme solar particle event occurred in about 775 AD basing on the tree-ring chronology (Miyake et al., 2012).

Collaboration

– not specified –

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