[S5-5] Diurnal anisotropy of the Galactic Cosmic Rays flux intensity at high latitude and at equatorial latitude observations

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Primary Galactic Cosmic Ray (GCR) particles enter the atmosphere and collide with the air molecules. The new secondary cosmic ray particles, produced in a process called a cosmic ray shower, can be measured on the Earth's surface by the neutron monitors. The ground-based neutron monitors detect portion of the primary cosmic ray spectrum in approximately 500 MeV to 20 GeV. The diurnal variations are changes of GCR intensity with the amplitude of 1~2 %. We have investigated solar cycle variation of the diurnal anisotropy of GCR ground observations at high latitude and at low latitude. The diurnal variation shows the distinct directional anisotropy over two solar cycles without any seasonal change. The constant diurnal anisotropy can be interpreted as the evidence of invariable interaction mode between the heliospheric magnetic fields and the Earth's magnetosphere in both solar minimum and maximum periods.

[S5-6] Retrieval of Local Interplanetary Dust Properties by ASTRO-F *

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We propose to probe IR emission properties of local IPDs by ASTRO-F. In phase 2 of the mission, the ASTRO-F will make lateral scans over ±0.5° range centered approximately at solar elongation 90°. This will provide us with an observational means to take derivatives of the ZE brightness with respect to the solar elongation. Since the resulting differential ZE brightness can be interpreted as the product of mean volume emissivity and the path length covering the ±0.5° interval, we will measure the IR emission properties of the local IPDs directly.
The IRC and FIS aboard the ASTRO-F promise us observational accuracy better than 10-3. On the other hand, the non-zero eccentricity (=0.0167) of the Earth's orbit would bring ±3.34% changes over a year to the ZE brightness, which is sufficiently large to determine the temperature for the local IPDs as a function of heliocentric distance. This will fix, for the first time, the exponent in the power-law relation $T(r) = To\ (r/ro)-\delta$ for the dust temperature. Along this line of thoughts we will perform numerical simulations, which will demonstrate that the probing of local IPD properties is a feasible space experiment for ASTRO-F.
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