



Contribution ID : 734

Type : Oral

Changing Anomalous Cosmic Ray Radial Intensity Gradients Between 1 AU and Voyager with the Return to Solar Minimum

Saturday, 7 July 2007 12:29 (0:12)

Abstract content

Using the Solar Isotope Spectrometer (SIS) on NASA's ACE spacecraft, we have measured the composition and energy spectra of anomalous cosmic rays (ACRs) near 1 AU down to energies of ~ 10 MeV/nucleon since August 1997. Recently these measurements have been augmented by data from the Low Energy Telescope (LET) on the STEREO spacecraft, which allows us to extend the energy spectra down to ~ 3 MeV/nucleon. As solar minimum modulation conditions return, ACR intensities at 1 AU are recovering, although they are still a factor of ~ 5 lower than in 1997. Also, their intensities during the present $A < 0$ magnetic polarity cycle are significantly lower relative to galactic cosmic rays (GCRs) than they were during the last $A > 0$ cycle.

We present updated measurements of the variation of the ACR oxygen intensity at 1 AU throughout the solar cycle. Combined with observations from Voyager 1 and 2 in the outer heliosphere, we estimate the large-scale intensity gradients of ACR oxygen and GCR carbon at solar maximum, solar minimum, and during the ongoing recovery, and we investigate the role of drifts and convective processes in ACR modulation.

This work was supported by NASA under grants NAG5-12929, NAS5-03131, and contract NAS7-03001.

If this papers is presented for a collaboration, please specify the collaboration

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olive, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 1 (SH), pages 807-810

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Session Classification : SH 3.6, SH 3.3, SH 4.2, SH 3.1

Track Classification : SH.4.2