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On the origin of the knees in the cosmic-ray energy spectrum

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Abstract content

Combining diffusion equation solutions with direct Monte-Carlo simulations of charged particle trajectories, the propagation of cosmic rays in the Galaxy is investigated. Different assumptions on the shape of the regular Galactic magnetic fields and source distributions are considered and their influence on cosmic-ray life-times and the energy spectrum obtained at Earth is examined. The origin of the knee in the energy spectrum at *4*10ˆ15 eV and the second knee at 4**10ˆ17 eV is discussed. In particular, it is investigated whether the knee can be explained by propagation effects only and if the second knee is due to the end of the galactic component with a strong contribution of elements heavier than iron.

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'Olivo, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 4 (HE part 1), pages 261-264

Primary author(s) : Dr. HOERANDEL, Joerg (University of Karlsruhe)

Co-author(s) : Dr. KALMYKOV, Nikolai (Lomonosov Moscow State University); Mr. SILAEV, A.A. (Lomonosov Moscow State University); Mr. TIMOKHIN, A.V. (Lomonosov Moscow State University)

Presenter(s) : Dr. HOERANDEL, Joerg (University of Karlsruhe)

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