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Cosmic Ray Acceleration by Stochastic Fields

Abstract content

In 1949 Fermi proposed the stochastic acceleration as a particle acceleration mechanism. Fermi spoke of large clouds magnetized that were the responsible for this acceleration. In this work I have focused in the stochastic acceleration due to fluctuations of the magnetic field of small scale that show to be extremely efficient accelerating. I show that with a force of 10e-16 N a proton can be accelerated from 0 to 10e9 eV in only 70 days and from 0 to 10e12 eV in 90,000 years. The limit of this mechanism is smaller to 10e15 eV since more energy than that requires of more time than the age of the universe. Since the time in which this mechanism accelerates depends on the average force exercised by the fluctuations then is possible that in very turbulent zones of the universe, greater energies can be reached in smaller time. For example if the average force is 10e-11 N energy of 10e19 eV is reached in 893 million years.

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

Summary

Reference

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