

Perpendicular transport of energetic particles on short and long scales

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Abstract. The problem of the transport of cosmic rays normal to the average magnetic field in a turbulent astrophysical plasma is discussed in the context of impulsive and long-time behavior in the heliosphere. Recent ACE observations have shed considerable light on the different modes of transport. In particular, observations of dropouts during impulsive solar cosmic-ray events lead to a picture where steep spatial gradients across the magnetic field and large perpendicular

diffusion are complementary parts of transport in a given magnetic field. We will present the results of new analyses and simulations which give further insights into this phenomenon. Applications of these ideas to other situations such as galactic cosmic rays in the galaxy will be discussed.

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