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Flux tubes in the solar wind and perpendicular diffusion of energetic particles GANG LI, Space Sciences Laboratory, University of California, Berkeley, CA, GANG QIN, State Key Laboratory of Space Weather, Center for Space Science and Applied Research, Chinese Academy of Sciences, Beijing, China
— Recent studies showed that flux tubes may be very common in the solar wind and solar wind plasma resides in individual flux tubes. Observations show that upon cross the boundary, plama properties, in particular magnetic field directions often change substantially. The presence of these structures introduces a new source of solar wind turbulence intermittency and can affect the transport of energetic particles. We study the effects of flux tubes on the transport of energetic particles in the solar wind. We construct a toy model of the solar wind turbulence by including explicitly flux-tube-like structures and calculate numerically the particle diffusion coefficients by following single particle trajectory. we find that flux tubes in the solar wind can lead to stronger scatterings of particles in both directions parallel and perpendicular to the large scale background magnetic field. In particular a true diffusion in the large scale perpendicular direction (with respect to B_0) is obtained even when the local *intrinsic* turbulence in individual cells are of pure slab.

Gang Li

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