THREE-DIMENSIONAL SCATTERING OF COSMIC RAYS IN THREE-DIMENSIONAL MAGNETIC TURBULENCE

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This work applies quasi-linear theory of energetic particle scattering in fully three-dimensional MHD turbulence, in general, to evaluate the three-dimensional diffusion tensor in momentum space and the parallel and perpendicular and drift components of the diffusion tensor used in transport equations and acceleration theories. It uses recent advances by Oughton, et al. (Phys. Rev. E, 1997), in understanding the theoretical three-dimensional structure of MHD turbulence. It also uses the first results in understanding and inverting all tensor elements of the reduced frequency spectra measured by Horbury, et al. with Ulysses in the solar minimum, polar, solar wind, to evaluate the diffusion tensor there.