PITCH ANGLE DEPENDENT ACCELERATION OF PROTONS AT QUASI-PARALLEL SHOCK WAVES

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We investigate shock acceleration by solving the pitch angle dependent focused transport equation by means of a Monte Carlo approach. This approach does not require isotropic pitch angle distributions of accelerated particles required in the diffusive shock approximation (DSA) and allows relatively easy to incorporate the effect of acceleration itself. In the energy range where boundary conditions do not play a decisive role the resulting energy spectrum coincides with the prediction of the DSA model. We investigate the role of boundary conditions and injection energy on the resulting spectra. The parameters used in our simulations are close to the ones observed in the heliosphere by presently active spacecraft.