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On the perpendicular diffusion of solar energetic particles

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Observations show that solar energetic particles, even those accelerated during smaller impulsive events, are transported very effectively across the background magnetic field; at 1 AU, particle intensities may extend up to 360 degrees in longitude in extreme cases. We present modeling results of such events, examining the effectiveness of mainly perpendicular diffusion. In our model, we include theoretically motivated transport parameters (for both pitch-angle scattering and perpendicular diffusion) based on some of the latest and most comprehensive transport theories. We also examine if, from a modeling point-of-view, it is possible to find observational quantities that can be used to disentangle whether extended sources or perpendicular diffusion, or some combination of the two processes, are primarily responsible for the longitudinal transport of these particles.

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