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## Interpreting the Reservoir Phenomenon in Solar Energetic Particle Events

### Abstract content

From in situ measurements in the heliosphere researchers have reported the “reservoir” phenomenon during the decay phase of gradual solar energetic particle events. Particle intensities observed by different spacecraft during individual gradual events are nearly equal even if the spacecraft are separated by several AU in radius and latitudinal separations as large as 70 degrees. M.~A. Lee suggested that adiabatic cooling is the reason for the reservoir effect. D.~V. Reames preferred shock acceleration. But the physical mechanism for this is not yet clear. We demonstrate here that this phenomenon can be reproduced by a solar-energetic transport model that includes drift, energy loss, and both parallel and perpendicular diffusion. We present results of 2D numerical solution to Parker’s transport equation. The numerical demonstrations of the reservoir phenomenon are compared with observations from Ulysses , IMP-8, and ACE during the period of September 12 - 20, 2000. We find that no special assumptions are necessary to reproduce the reservoir effect. It is the perpendicular diffusion that causes the reservoir effect.

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### Summary

### Reference

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