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Cosmic ray acceleration in the presence of super diffusion

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Alfvenic turbulence that determines the magnetic field wandering exhibit the process of superdiffusion which results in the perpendicular
displacement to change as y~x^3/2, where x is the distance measured along magnetic field is the distance perpendicular to the magnetic field,
provided that y is less than the injection scale of the turbulence. This process changes substantially the acceleration of cosmic rays in perpendicular
shocks, which were considered as the accelerating agent of anomalous cosmic rays. I shall discuss how the process of superdiffusion changes
the acceleration in parallel and perpendicular shocks and show the analogies between the shock and reconnection acceleration.

Session Classification: Cosmic ray acceleration in the presence of super diffusion - Alex Lazarian, UW-Madison