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Heating and acceleration of particles caused by reconnection of turbulent fields.

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Magnetic reconnection of the weakly turbulent magnetic field was proven to be a fast process in the MHD limit. We show that this process can result in the particle acceleration through the first order Fermi process. We use the simulations of magnetic reconnection in the presence of turbulence and show that the process of acceleration of particles is radically different in this case compared to the particle acceleration in turbulence without reconnection. In particular, momentum of the particles increases steadily rather than undergoing a random walk. The process of acceleration can take place both in collisional and collisionless fluids, as the reconnection process we consider does not depend on the fluid collisionality. The process may be of importance for a variety of astrophysical situations, including Solar flares, acceleration particles in the accretion disks and astrophysical jets.