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Diffusion and energization of charged particles in time-dependent chaotic magnetic field[1] GANG LI, BRAHMANANDA DASGUPTA, ABHAY RAM — Chaotic magnetic field can be obtained from simple steady state current system consisting of straight wires and loops in an asymmetric configuration. Since in solar flares macroscopic and time varying currents in the form of filaments and/or loops commonly exist, the resulting magnetic field must be chaotic. Consequently, to understand solar flare phenomena, studying particle motion in a time-dependent chaotic magnetic field is of fundamental importance. These currents, time-varying, can induce electric fields. Therefore, electrons and ions are subject to potential (2nd order Fermi) acceleration. We report recent results on charged particle motion in a chaotic electric and magnetic fields. Particle trajectories are followed using the Lorentz equation with a 4-th order Runge-Kutta skeme. The running diffusion coefficient, particle spectrum, and the chaotic magnetic field spectrum are obtained. Implications of our result to particle acceleration and heating at a flare site are discussed.

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