Título: Particle Acceleration in Turbulence and Weakly Stochastic Reconnection

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The magnetic fields can change their topology through a process known as magnetic reconnection. This process in not only important for understanding the origin and evolution of the large-scale magnetic field, but is seen as a possibly efficient particle accelerator producing cosmic rays mainly through the first order Fermi process. In my seminar I will present our work on understanding the properties of particle acceleration inserted in reconnection zones and show that the velocity component parallel to the magnetic field of test particles injected in magnetohydrodynamic (MHD) domains of reconnection without including kinetic effects, such as pressure anisotropy, the Hall term, or anomalous effects, increases exponentially. Also, the acceleration of the perpendicular component is always possible in such models. Within contracting magnetic islands or current sheets the particles accelerate predominantly through the first order Fermi process, as previously described, while outside the current sheets and islands the particles experience mostly drift acceleration due to magnetic fields gradients. The importance of inclusion of a guide field or performing fully three dimensional studies for a complete understanding of the process of particle acceleration in astrophysical reconnection environments is demonstrated as well.