

$\bar{d}14$ 1st cosmic ray antideuteron workshop

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Can Primordial Antideuterons be Detected in the Cosmic Radiation?

Friday, June 6, 2014 9:00 AM (30 minutes)

I present a simple analytic model for the diffusion of cosmic rays through intergalactic space. Estimates for the intergalactic magnetic field provide severe constraints on the mean free path for cosmic ray diffusion. For reasonable models and energies below 10^6 GeV, a completely negligible number of particles can enter our Galaxy from distances greater than ~ 100 Mpc. Particle destruction in galaxies along the diffusion path results in an exponential suppression of any possible flux of extragalactic cosmic rays. Finally, the diffuse gamma ray flux can be used to conclude that any hypothetical domains of anti-matter must be at distances exceeding the horizon scale. Even in the extreme case of a baryon symmetric universe, cosmic rays are shown to be an ineffective tool to search for primordial antideuterons.

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