d14 1st cosmic ray antideuteron workshop

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Including anti-deuteron observables in global fits to new physics scenarios

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The propagation of cosmic rays (CRs) is still poorly understood, but it plays a key role in the physical processes of our Galaxy. By understanding CR propagation, we can determine which objects produce and accelerate them, and gain insights into the nature of dark matter. Anti-deuterons are a very promising and timely CR channel in which to look for indirect evidence of dark matter annihilation, because at low energies there is almost no astrophysical background, and experiments will reach the sensitivity required to probe dark matter models within 5 years. To fully exploit future data, we use improved anti-deuteron production as well a CR propagation models, and incorporate those models and their uncertainties into a global statistical analysis combining data from CRs and other collider, direct and indirect searches for dark matter. The result will be a simultaneous fit to CR propagation and dark matter models, providing the best understanding to date of the impacts of anti-deuteron searches on theories of dark matter.

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