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Light Dark Matter from Inelastic Cosmic Ray Collisions

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Direct detection experiments relying on nuclear recoil signatures lose sensitivity to sub-GeV dark matter for typical galactic velocities. This sensitivity is recovered if there exists another source of flux with higher momenta. Such an energetic flux of light dark matter could originate from the decay of mesons produced in inelastic cosmic ray collisions. I present in this talk the dark matter flux expected from such cosmic beam dump experiment and the resulting limits on the model parameters using direct detection experiments such as XENON1T and the projected LZ. A particular model involving a hadrophilic scalar mediator is also considered and I show how the limits compare with dedicated beam dump experiments such as MiniBooNE.

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