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Empirical Determination of Dark Matter Velocity Distribution Using Metal Poor Stars

Thursday 10 August 2017 14:00 (15 minutes)

In this talk, I will show that metal poor halo stars have similar kinematics as dark matter in the solar neighborhood, using the hydrodynamic zoom-in simulation Eris of the Milky Way. Within this expectation, I extract the first empirically-determined dark matter velocity distribution using the velocity dispersions of the halo stars as measured by the Sloan Digital Sky Survey, and show that using this newly-found velocity distribution, the direct detection limits on dark matter scattering off nuclei are loosened by almost an order of magnitude at low dark matter masses.

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