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Post-Recombination Spectral Distortions from Dark Matter Energy Injection

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Dark matter interactions with Standard Model particles can inject energy at early times, altering the standard evolution of the early universe. In particular, this energy injection can perturb the spectrum of the cosmic microwave background (CMB) away from that of a perfect blackbody. For this study, I will discuss recent work to update the DarkHistory code package to more carefully track interactions among low energy electrons, hydrogen atoms, and radiation, in order to accurately compute the evolution of the CMB spectral distortion in the presence of Dark Matter energy injection. I will show results for the contribution to the spectral distortions from redshifts $z < 3000$ for arbitrary energy injection scenarios.

In-person participation

Yes

Primary author: QIN, Wenzer (MIT)**Presenter:** QIN, Wenzer (MIT)**Session Classification:** Dark Matter**Track Classification:** Dark Matter