

Sudakov log resummation for indirect detection of heavy WIMP dark matter

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Abstract content

In some models for WIMP dark matter, radiative corrections dominate over the LO contributions in the computation of annihilation cross sections relevant for indirect detection. These corrections need to be resummed to all orders in perturbation theory for theoretical predictions to be sensible. In this talk I will employ -and briefly review- resummation methods that are traditionally used in other contexts (colliders, etc.) in order to mitigate those large radiative corrections that, on top of the Sommerfeld effect, are encountered in the phenomenology of heavy DM models. Although most of the discussion can be applied to a larger family of models and detection channels, I will focus on the pure wino model and the spectral gamma-ray line feature.

More specifically, we use the soft collinear effective theory (SCET) approach to resum the large Sudakov corrections (at NLL' accuracy) for the computation of the semi-inclusive photon energy spectrum in $\chi_0\chi_0\rightarrow\gamma+X$ in the vicinity of the maximal photon energy $E_\gamma=m\chi$.

Results and phenomenological aspects in light of the CTA gamma-ray telescope will of course be also presented and discussed.

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