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Role of electroweak radiation in predictions for dark matter indirect detection

A very exciting challenge in particle and astroparticle physics is the exploration of the nature of dark matter.
The striking evidences of the existence of dark matter
are also the strongest phenomenological indications for physics beyond the Standard Model.
A huge experimental effort is currently made at colliders and via astrophysical experiments to shed light on the nature of dark matter.
More specifically dark matter may be produced at colliders or detected through direct and indirect detection experiments.
The interplay and complementarity between these different approaches and techniques offers extraordinary opportunities to improve our understanding of
the nature of dark matter or to set constraints on dark matter models.

In indirect detection, in particular, one searches for dark matter annihilation products, that produce secondary antimatter particles like positrons and antiprotons.
Such antimatter particles propagate through the Galaxy and can eventually be detected at Earth by astrophysical experiments.

A particularly interesting point is the importance of electroweak (EW) corrections to the predictions for the expected fluxes at Earth.
The inclusion of EW radiation from the primary dark matter
annihilation products can actually significantly affect the spectra of the secondary SM particles.
The EW radiation can be described using fragmentation functions, as done for instance in QCD.
We study the quality of this approximation in a simplified supersymmetric model and in a Universal Extra Dimension model.

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