

# Constraints on Dark Matter Annihilation and Decay from CALET Data

Thursday, August 30, 2018 5:35 PM (0:15)

## Abstract content

Installed on the ISS in August 2015 and taking data since October of that year, CALET (CALorimetric Electron Telescope) is directly measuring the electron+positron cosmic-ray spectrum up into the TeV-region with fine energy resolution and good proton rejection. The latest published total electron+positron spectrum is analyzed for Dark Matter signatures. Limits on annihilation and decay of Dark Matter are calculated by fitting the expected flux from Dark Matter on top of a parametrization of the astrophysical background spectrum to both CALET data and the positron flux measured by AMS-02. Starting from a purely astrophysical scenario with a nearby pulsar as the origin of the positron excess, the spectrum from Dark Matter annihilation or decay, which is numerically calculated with DRAGON, is added, and its scale-factor increased until the fit quality reaches the limit threshold. The flux from Dark Matter is calculated for multiple Dark Matter candidates with varying mass, yielding limits on annihilation cross-section or lifetime as a function of Dark Matter mass for each. In addition to presenting these Dark Matter limits and their comparison with results from other Dark Matter detection methods, possible interpretations of the spectrum measured by CALET including a contribution from Dark Matter will be discussed.

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**Session Classification :** Dark Matter

**Track Classification :** Dark Matter