

**Executive Summary for Poster 1150  
ICRC 2021  
12-23 July 2021  
Berlin, Germany**

## Charge Loss Correction in the Silicon-Tungsten Tracker-Converter for Proton-Helium Charge Identification in the DAMPE Detector

A. Ruina<sup>\*1</sup>, M. Stolpovskiy<sup>1</sup>, M. Deliyergiyev<sup>1</sup>, Y. Cui<sup>2</sup>  
on behalf of the DAMPE collaboration

July 6, 2021

The DArk Matter Particle Explorer (DAMPE) is a satellite-borne experiment, in operation since 2015, aimed at studying high-energy gamma rays and cosmic nuclei fluxes. Of the various sub-detectors in the DAMPE payload, the Silicon-Tungsten tracker-converter (STK) plays a significant role in the charge measurement of incoming ions. Depending on the angle of inclination of the impinging particle and its position of impact on these strips, the collected charge can spread between the strips which results in a small fraction of signal loss. The  $\eta$  variable is used to identify this spread of charge across the strips and correct for the associated charge loss. This brings us closer to accurate determination of particle charge which is crucial for ensuring a good discrimination between particles. The charge loss correction, or the  $\eta$ -correction is, was developed and deployed. It is expected to play an important role in the determination of heavy ions by the DAMPE detector. It has helped reduce the proton background for the helium identification in STK by a factor of 1.5 for MIP tracks, has been successfully applied also to carbon nuclei and is currently being adapted for taking into account saturation effects of heavier nuclei.

---

\* Presenter

<sup>1</sup>Department of Nuclear and Particle Physics, University of Geneva, CH-1211, Switzerland

<sup>2</sup>Key Laboratory of Dark Matter and Space Astronomy, Purple Mountain Observatory, Chinese Academy of Sciences, Nanjing 210023, China