



Contribution ID: **1096**

Type: **Talk**

## Measurement of the all-particle energy spectrum up to 0.5 PeV with DAMPE

*Tuesday 15 July 2025 13:35 (15 minutes)*

The DArk Matter Particle Explorer (DAMPE) is a space based detector operating since its launch in December 2015. The primary goals of the mission include the measurement of the cosmic  $e^+e^-$  spectrum, the high energy gamma-ray astronomy, and the analysis of the flux and composition of cosmic ray protons and nuclei from tens GeV up to several hundreds TeV.

This study presents a direct measurement of the all-particle cosmic ray energy spectrum using data collected by DAMPE since January 2016. A dedicated analysis framework has been developed, which implements a less restrictive event selection criteria compared to those in single species spectral measurements. In particular, without applying charge selection and by using looser tracking requirements, this analysis enables the collective study of events of all particle species. This approach is designed to minimize systematic biases while maximizing statistical significance, allowing for measurements at higher energies than those achievable through individual species analyses.

This measurement results in providing the all-particle flux over an energy range spanning from few hundreds GeV to the sub-PeV domain. Thus, it approaches the so-called spectral knee with unprecedented precision for a space-based experiment, while having a wide energy overlap with ground-based observations. Possible features in the all-particle spectrum can then be studied and compared with single species spectral breaks and galactic cosmic ray acceleration/propagation models. The preliminary results of this analysis will be presented and discussed.

### Collaboration(s)

DAMPE collaboration

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**Session Classification:** CRD

**Track Classification:** Cosmic-Ray Direct & Acceleration