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The nine and a half years in-orbit operation performance of the silicon-tungsten tracker-converter of DAMPE

Since its launch, in December 2015, the space-based DArk Matter Particle Explorer (DAMPE) has been operating smoothly, continuously collecting data for more than nine and a half years. The Silicon-Tungsten tracker-converter (STK) of DAMPE is designed to measure the absolute value of the charge and precisely reconstruct the trajectory of the incident charged particle. The STK consists of six tracking planes (6x, 6y) made of single-sided silicon micro-strip detectors, mounted on seven support trays. To further enhance photon conversion into electron-positron pairs ($\gamma \rightarrow e^+e^-$), tungsten plates (1 mm thick) are embedded in the second, third, and fourth trays from the top. Commissioned rapidly after the launch, the STK has been functioning exceptionally well ever since. This contribution presents the in-orbit calibration and performance of the STK over its nine and a half years of operation, focusing on noise behaviour, as well as thermal and mechanical stability.

Collaboration(s)

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