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CALET measurements with cosmic nuclei: expected performances of tracking and charge identification

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CALET is a space mission currently in the final phase of preparation for a launch to the International Space Station (ISS), where it will be installed on the Exposed Facility of the Japanese Experiment Module (JEM-EF). In addition to high precision measurements of the electron spectrum, CALET will also perform long exposure observations of cosmic nuclei from proton to iron and will detect trans-iron elements with a dynamic range up to $Z=40$. The energy measurement relies on two calorimeter systems: a fine grained imaging calorimeter (IMC) followed by a total absorption calorimeter (TASC) for a total thickness of $30 X_0$ and 1.3 proton interaction length.

A dedicated module (a charge detector, CHD), placed at the top of the apparatus, identifies the atomic number Z of the incoming cosmic ray, while the IMC provides tracking capabilities and a redundant charge identification by multiple dE/dx measurements. In this paper, the expected performances of the tracking and charge identification systems of CALET will be discussed. The CALET mission is funded by the Japanese Space Agency (JAXA), the Italian Space Agency (ASI), and NASA.

Collaboration

CALET

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