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Latest results on observations with the CALorimetric Electron Telescope (CALET) on the International Space Station

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The CALorimetric Electron Telescope (CALET) is a Japan-led experiment installed on the International Space Station (ISS) in collaboration with Italy and the United States. It was developed with the purpose to carry out precision measurements of high energy cosmic-rays (CR), to investigate their origin, the mechanisms of acceleration and galactic propagation, and the presence of possible nearby astrophysical CR sources.

Optimized for the measurement of the electron+positron spectrum, CALET is collecting data since October 2015 with excellent performance and with no major interruptions.

The instrument consists of a CHarge Detector (CHD) made of two layers of segmented plastic scintillators, a 3 radiation length thick tungsten-scintillating fiber IMaging Calorimeter (IMC) and a 27 radiation length thick PWO Total AbSorption Calorimeter (TASC). CALET is able to obtain precise measurements of the fluxes of CR electrons and γ rays up to rays up to the TeV region, the energy spectra of CR nuclei from proton to nickel up to hundreds of TeV, secondary-to-primary ratios of individual elements from proton to iron and relative abundances up to $Z=40$.

In this contribution, we present the highlights of CALET observations based on the data taken during the first seven years of observation, including a direct measurement of the electron+positron spectrum, proton spectrum from 50 GeV to 60 TeV and helium spectrum from 40 GeV to 250 TeV, together with a direct measurement of other nuclei up to nickel. Some results on the electro-magnetic counterpart search for LIGO/Virgo gravitational wave events are also included.

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