

CALorimetric Electron Telescope (CALET) on the International Space Station

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The CALorimetric Electron Telescope (CALET) space experiment, which has been developed by Japan in collaboration with Italy and the United States, is a high-energy astroparticle physics mission installed on the International Space Station (ISS). The primary goals of the CALET mission include studying the details of galactic cosmic-ray acceleration and propagation, and searching for possible nearby sources of high-energy electrons and dark matter signatures. The CALET experiment will measure the flux of cosmic-ray electrons (including positrons) to 20 TeV, gamma-rays to 10 TeV and nuclei with $Z=1$ to 40 up to 1,000 TeV.

The instrument consists of two layers of segmented plastic scintillators for the cosmic-ray charge identification (CHD), a 3 radiation length thick tungsten-scintillating fiber imaging calorimeter (IMC) and a 27 radiation length thick lead-tungstate calorimeter (TASC). CALET has sufficient depth, imaging capabilities and excellent energy resolution to allow for a clear separation between hadrons and electrons, and between charged particles and gamma rays. The instrument was launched on August 19, 2015 to the ISS with HTV-5 (H-II Transfer Vehicle 5) and installed on the Japanese Experiment Module-Exposed Facility (JEM-EF) on August 25.

Since the start of operation in mid-October, 2015, a continuous observation has been kept mainly by triggering high energy (>10 GeV) cosmic-ray showers without any major interruption. The number of the triggered events over 10 GeV is nearly 20 million per month. By using the data obtained during the first two-years, we will have a summary of the CALET observations: 1) Electron+ Positron energy spectrum, 2) Proton and Nuclei spectrum, 3) Gamma-ray observation, with results of the performance study on orbit. Moreover, we are carrying out follow-up observations of the electromagnetic counterparts to LIGO-VIRGO gravitational wave events.

We will present a brief summary of the scientific results obtained by observations over 4 years on the ISS, and explain the characteristics of the CALET instrument developed in cooperation with Japan Aerospace Exploration Agency (JAXA) with the performance in space.

Authors: Prof. TORII, Shoji (WISE, Waseda University); ON BEHALF OF THE CALET COLLABORATION

Presenter: Prof. TORII, Shoji (WISE, Waseda University)

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