

An end-to-end in-flight calibration of the Mini-EUSO detector

Mini-EUSO is a wide Field-of-View (FoV, 44 deg) telescope currently in operation from a nadir-facing UV-transparent window in the Russian Zvezda module on the International Space Station (ISS).

It is the first detector of the JEM-EUSO program deployed on the ISS. Mini-EUSO is mainly sensitive in the 290 - 430 nm bandwidth. Light is focused by a system of two Fresnel lenses of 25 cm diameter each on an array of 36 Multi-Anode Photomultiplier Tubes (MAPMTs) for a total of 2304 pixels working in photon counting mode, in three different time resolutions of 2.5 μ s, 320 μ s and 40.96 ms at the same time. In the longest time scale, the data is continuously acquired without a trigger system, and allows a continuous monitoring of the UV emission of the Earth, which is best suited for the observation of ground sources.

For this reason, it has been used to observe the signal produced by two UV flasher systems assembled on ground and fired in two different observational campaigns in order to perform an end-to-end calibration of Mini-EUSO.

In this contribution, the assembling of the UV ground flasher, the operation of the field campaign and the analysis of the obtained data is presented. The result is compared with the overall efficiency computed from the expectations which take into account the atmospheric absorption and the parametrisation of different effects such as the optics efficiency, the MAPMT detection efficiency, BG3 filter transmittance and the transparency of the ISS window.

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