

The Mini-EUSO telescope on board the International Space Station: first results in view of UHECR measurements from space

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Mini-EUSO is a telescope launched on board the International Space Station in 2019 and currently located in the Russian section of the station and viewing our planet from a nadir-facing UV-transparent window in the Zvezda module. The instrument is based on an optical system employing two Fresnel lenses and a focal surface composed of 36 Multi-Anode Photomultiplier tubes, 64 channels each, for a total of 2304 channels with single photon counting sensitivity and an overall field of view of 44° . Mini-EUSO also contains two ancillary cameras to complement measurements in the near infrared and visible ranges. Main scientific objectives of the mission are the search for nuclearites and Strange Quark Matter, the study of atmospheric phenomena such as Transient Luminous Events, meteors and meteoroids, the observation of sea bioluminescence. Mini-EUSO can map the night-time Earth in the near UV range (predominantly between 290 – 430 nm), with a spatial resolution of about 6.3 km and different temporal resolutions of 2.5 μ s, 320 μ s and 41 ms. Mini-EUSO observations are extremely important to better assess the potential of a space-based detector of Ultra-High Energy Cosmic Rays (UHECRs) such as K-EUSO and POEMMA. In this contribution we describe the detector and present the various phenomena observed in the first two years of operation and place them in the context of UHECR observations from space.

Primary authors: BERTAINA, Mario Edoardo (INFN Torino & University Torino); COLLABORATION, for the JEM-EUSO

Presenter: BERTAINA, Mario Edoardo (INFN Torino & University Torino)

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