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Mini-EUSO: a telescope on board the International Space Station for the observation of terrestrial and cosmic UV emissions

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The Mini-EUSO instrument is a UV telescope to be placed inside the International Space Station (ISS), looking down on the Earth from a UV-transparent window in the Russian Zvezda module. Mini-EUSO will map the earth in the UV range (300 - 400 nm) with a spatial resolution of 6 - 11 km and a temporal resolution of 2.5 μ s. The main Mini-EUSO objectives are the study a variety of atmospheric phenomena such as Transient Luminous Events (TLEs), meteors and meteoroides, the search for Strange Quark Matter (SQM) and bioluminescence. Furthermore, Mini-EUSO could represent the first step in a roadmap of potential debris removal via laser ablation. Moreover, the high-resolution mapping of the UV emissions from Earth orbit allows Mini-EUSO to serve as a pathfinder for the study of Extreme Energy Cosmic Rays (EECRs) from space by the JEM-EUSO Collaboration.

Mini-EUSO is a compact telescope, with a large field of view, based on an optical system employing two Fresnel lenses, a focal surface composed of 36 multi-anode photomultiplier tubes and an acquisition and storage system. In addition to the main UV detector, Mini-EUSO contains two ancillary cameras for complementary measurements in the near infrared and visible range.

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