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Mini-Euso, a pathfinder on the ISS to detect [2 - 10 cm] debris

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Mini-Euso is a small telescope to be installed inside the ISS in 2017. It is a small pathfinder of the main Jem-Euso mission in which a large UV telescope is to be set outside the ISS to capture the most energetic cosmic rays by detecting the [300-400 nm] fluorescence light from nitrogen struck by the shower charged particles.. Mini-Euso looks at earth through a UV window on the Russian segment, with two 25 cm Fresnel lenses. As a Jem-Euso pathfinder, it is primarily dedicated to assess the technology and look during the night at luminous events like storms, meteors, etc. It detects single photo-electrons with large dynamics [from 0.1 to 10^6 pe par time gate (2.5 μ s)]. At ISS sunset and sunrise, the earth is in the dark for 5 mn, while ISS is sun illuminated. During these 10 mn every 90 mn, we will observe debris under the ISS (at 300 to 400 km altitude) by their brightness. They will look as a slow moving track on the focal surface (48 x 48 pixels, recorded every 2.5 μ s). It is the first step to observe the [2-10 cm] debris, before using a satellite big enough to install a CAN laser which would shoot at it to ablate and recoil it to earth. Some 50 such debris could be detected that way during a year of observation.

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