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The EUSO mission to study UHECR from space: status and perspectives

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The EUSO collaboration has been studying a detector to be installed on the International Space Station which will observe UHECR from space for the first time. The observation of Ultra-high-energy cosmic rays (UHECR) from space offers several advantages such as large field of view, uniform observation of both celestial hemispheres, uniform detector response. For these reasons, space-based observatories are complementary to the ground-based detectors.

The EUSO Collaboration already built two pathfinders to test high-performance electronics and optical systems to meet the science requirements and the constraints (mass, power, hardness...) of space-borne detectors. Second generation pathfinders, EUSO-SPB and Mini-EUSO, are currently under development. EUSO-SPB is a NASA Super Pressure Balloon payload scheduled to fly from New Zealand in Spring 2017 for a flight duration which may reach 100 days. The main scientific objective is the first observation and measurements of UHECR generated Air Showers by looking down from near space with a fluorescence detector. Mini-EUSO telescope (a joint ASI-Roscosmos mission) will be placed on the Russian Module of the International Space Station by end 2017. Its science objectives are the study of UV emission of natural, astronomical and artificial origin and of atmospheric phenomena. In this contribution, we will also report on the status and perspectives of the future EUSO mission.

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