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The JEM-EUSO Program to study UHECRs from Space

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The JEM-EUSO program aims to study Ultra High Energy Cosmic Rays (UHECRs) from space with a potential for a significant increase in exposure and a uniform coverage of the sky. To achieve this goal within the strong constraints of power, mass, size and bandwidth of space detectors, a number of novel technologies, from optics to sensors, front-end and read-out electronics have been developed over the years and used in several precursor telescopes: 1) in August of 2014 a balloon flight (EUSO-BALLOON) was successfully performed from Timmins (Canada); 2) since February of 2015 a ground-based detector (EUSO-TA) has been operating at the Telescope Array site in Utah. Future steps of the JEM-EUSO program include: 3) EUSO-SPB a NASA Super Pressure Balloon (SPB) scheduled to fly from New Zealand in March 2017; 4) MINI-EUSO/UV Atmosphere - a detector to be placed inside the International Space Station in 2017; 5) K-EUSO, the first reflector detector to perform UHECR science from space (scheduled for 2020); 6) EUSO-FF, a free-flyer large field of view detector. In this work we will present the results from the first detectors and address the current status of research and future plans of the JEM-EUSO program.

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Primary author: CASOLINO, Marco (INFN)

Presenter: CASOLINO, Marco (INFN)

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