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The JEM-EUSO program to study Ultra-High Energy Cosmic Rays from Space

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The origin and nature of Ultra-High Energy Cosmic Rays (UHECRs) are still unsolved in the contemporary scenario of Astroparticle Physics. To give an answer to these questions is rather challenging because of the extremely low flux of a few per km^2 per century at extreme energies such as E > 5x10^19 eV.
The main objective of the JEM-EUSO program (Joint Experiment Mission - Extreme Universe Space Observatory) is the realization of a space mission devoted to the study of UHECR.
A super-wide-field telescope will look down from space onto the night sky to detect UV photons emitted from air showers generated by cosmic rays of highest energies in the atmosphere.
The JEM-EUSO collaboration has been developing different test experiments using fluorescence detectors to make a proof-of-principle of the UHECR observation from space, to meet the science requirements and the constraints (mass, power, hardness) of space-borne detectors, and to raise the technological level of the instrumentation to be employed in a space mission (EUSO-TA, EUSO-Balloon, EUSO-SPB, Mini-EUSO). The final goal of the collaboration is the realization of much more challenging missions such as K-EUSO and POEMMA.
This contribution will review scientific, technical and programmatic aspects, as well as the role of each mission in the program.

Collaboration name

JEM-EUSO Collaboration

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