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JEM-EUSO Science

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The Extreme Universe Space Observatory (EUSO) to be accommodated in the Japanese Experiment Module (JEM) of the International Space Station (ISS), JEM-EUSO, is designed to discover the origin of ultrahigh energy cosmic rays by observing extremely energetic extensive airshowers from space. The JEM-EUSO design is based on a wide field of view (60°) refractor with an ultrafast 0.3 M pixel UV camera that records the extensive airshower fluorescence and backscattered cherenkov. The main science goal of JEM-EUSO is to accumulate significantly higher number of events than available from ground-based observatories at the highest energies. The ISS orbit guarantees full sky coverage and its altitude provides the ability to monitor two orders of magnitude more atmosphere when compared to fluorescence telescopes on the ground. The large number of observed extremely energetic events will provide a sky map of the relatively nearby sources. The increase in statistics will also provide a measurement of the spectral shape around the GZK feature, which may have a recovery depending on the maximum energy of UHECR sources. Extremely energetic neutrinos may also be observed as well as fast atmospheric phenomena in the UV. JEM-EUSO will also test physics beyond the standard model by searching for the decay products of super-heavy dark matter and tracks produced by strangelets or meteoroids.

Collaboration

JEM-EUSO

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