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The Expected Angular Resolution Performance of the Tilted JEM-EUSO Instrument

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JEM-EUSO (The Extreme Universe Observatory onboard the Japanese Experiment Module) is a space borne UV-telescope which will be mounted on the ISS (International Space Station).

It is designed for the observation of UHECR induced extensive air showers (EAS) above an energy of 10^{19} eV by using the earth's atmosphere as a large detector.

Due to the amount of monitored target volume it gains an effective aperture of approx. $2 \cdot 10^5$ km² sr.

During the mission lifetime, JEM-EUSO will observe several hundred of events above $E = 5 \cdot 10^{19}$ eV, significantly improving the statistics in this part of the UHECR spectrum.

The default operation mode of the instrument is envisaged to be along its nadir direction.

However, in a later stage of the mission, a tilting of the telescope, away from its nadir direction, is discussed as a potential strategy to further increase the exposure at the highest energies.

In the tilted mode operation the exposure would increase by a factor of 5 to 7.

Hence, the regime of extreme energies above 10^{20} eV could be explored in a reasonable amount of time.

Naturally, in this setup the angular resolution of the instrument is expected to decrease.

In the scope of this work we evaluate the expected angular resolution performance of the JEM-EUSO instrument in dependence of the tilting angle.

Collaboration

JEM-EUSO

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