

Special Issue on the JEM-EUSO Mission

Andreas Haungs¹ · Gustavo Medina-Tanco² ·
Andrea Santangelo³

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This special issue of *Experimental Astronomy* summarises the key activities for the JEM-EUSO space mission, to be operated on board the International Space Station. JEM-EUSO is being designed to unveil the nature and the origin of the ultra-high energy cosmic rays from $E > 10^{19}$ eV to well beyond 10^{20} eV. JEM-EUSO will detect the UV light emitted by cosmic-ray generated air-showers in the earth's atmosphere. JEM-EUSO also addresses basic problems of fundamental physics at energies around 10^{20} eV, unachievable by man-made accelerators and of atmospheric phenomena.

The JEM-EUSO activities consists of the development of the main mission and of a series of pathfinder experiments. While the JEM-EUSO baseline is being improved some pathfinders have already been developed and are in operation, like the EUSO-Balloon program on board of stratospheric balloons or EUSO-TA deployed on ground in coincident operation with the Telescope Array air-shower experiment.

The articles of this special issue deal with crucial design issues, sub-systems and components of the baseline concept. In addition, the special issue include papers presenting results of detailed simulations and test measurements.

Many of the developments around the JEM-EUSO mission in its baseline configuration, described by the studies presented in this special issue, are of universal interest in the field and relevant for any future space based air-shower detector. The emphasis which the JEM-EUSO Collaboration places on designing, engineering, prototyping,

✉ Andreas Haungs
andreas.haungs@kit.edu

Gustavo Medina-Tanco
gmtanco@nucleares.unam.mx

Andrea Santangelo
andrea.santangelo@uni-tuebingen.de

¹ Institut fuer Kernphysik (IKP), Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany

² Instituto de Ciencias Nucleares, Universidad Nacional Autónoma de México (UNAM), Mexico City, Mexico

³ Institute for Astronomy and Astrophysics, Kepler Center, University of Tübingen, Tübingen, Germany

simulating and demonstrating the capabilities of such a mission is apparent from the mixture of the included papers.

We hope that you enjoy this summary of the present JEM-EUSO engineering and related activities, and we thank the authors, i.e., the entire Collaboration, the reviewers and the *Experimental Astronomy* staff for their assistance in producing the volume.

Andreas Haungs

Gustavo Medina-Tanco

Andrea Santangelo

Guest Editors