

**Project Title:**

## **JEM-EUSO**

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1. JEM-EUSO - the Extreme Universe Space Observatory onboard the Japanese Experiment module aims at measuring the ultra high energetic component of cosmic rays (UHECR). The detector will be mounted on the International Space Station to monitor the earth's atmosphere from above in order to observe UHECR induced air showers. Our group is carrying out computer simulations to evaluate the expected performance of the instrument.
2. The RIKEN Supercluster serves to achieve a high statistics of simulated UHECR events. Every event includes simulation of hadronic and electromagnetic interactions in atmosphere, production of fluorescence and Cherenkov light, transmission of photons in atmosphere, detector response and eventually reconstruction of the properties of the primary UHECR. Intermediate calculations are performed partly by parametrized and/or Montecarlo approaches.
3. Until now, no scientific results have been obtained on the RIKEN Supercluster., Only very recently we managed to compile our Simulationcode on the RICC.
4. Now, since our simulation framework is running on the RIKEN Supercluster we will be able to carry out extensive simulations. The emphasis will mainly be placed upon the production of air showers and reconstruction of UHECR events.
5. Since the JEM-EUSO project is a long term mission and the simulation studies still at the beginning, we expect to need at least two more years of RICC access. The roadmap of the planned simulations is still subject to change due to many open parameters still to be decided. Thus, we are unable to provide a precise schedule for the middle- or long-term perspective. However, in the next few months our concern will be the simulation of background, the implementation of clouds in our atmospheric simulations as well as the generation of a large database of UHECR events, that will serve as a base for comparison between different simulation codes.
6. As described above, up to the present, no significant amount of CPU time has been used. However, we are confident, that after about two weeks of testing, we will be able to use a large amount of the granted CPU time.
7. Because no simulations have been run so far, no research achievements have been made.

