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A web-based job and data management system for the HERD experiment

The High Energy cosmic-Radiation Detection (HERD) facility is a space astronomy and particle astrophysics experiment planned to be installed on the China Space Station. HERD is a China-led mission with Italy leading key European contributions. Its primary scientific goals include detecting dark matter in cosmic space, precisely measuring the energy spectrum and composition of cosmic rays, and conducting all-sky observation of high-energy gamma rays.

To meet these scientific objectives, the experiment demands a vast amount of storage and computing resources. Moreover, extremely large simulated data sets are required to study the performance of the detector, and these data sets may be distributed across China or Europe. In response, we have developed a web-based job and data management system (DMS). This system enables scientists to submit job requests transparently via web pages. Administrators, on the other hand, can evaluate these requests in light of resource utilization and assign jobs to the most suitable sites. This contribution will provide a comprehensive overview of the design and implementation details of DMS.

In the future, we plan to research an automatic decision-making function to achieve intelligent resource allocation.

References

Experiment context, if any

Significance

With DMS, scientists are enabled to submit jobs in a transparent manner. Administrators can allocate job execution sites according to resource utilization. Additionally, data information can be retrieved via web pages and is more easily accessible and utilized through APIs.

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