ASTROPHYSICS APPLICATIONS

eGee

Two major Virtual Organisations are hosted by EGEE in the field of astrophysics: The European Space Agency (ESA) Planck mission in the area of computation for astrophysics and MAGIC in the area of astro-particle physics. Although they are separate scientific projects, both share problems of computation involving large-scale data acquisition, simulation, data storage, and data retrieval.

The ESA **Planck** satellite mission will be launched in 2008. This experiment is aimed at mapping the microwave sky, performing at least two complete sky surveys with an unprecedented combination of sky and frequency coverage, accuracy, stability and sensitivity. Planck is composed of a number of microwave and sub-millimetre detectors that are grouped into a High Frequency Instrument (HFI) and a Low Frequency Instrument (LFI) and cover a frequency range from 30 up to 850 GHz. The LFI Data Processing Centre will be in charge of the processing of ~100MB of compressed data each day for a total amount of 100GB of raw data at the end of the mission.

One of the primary issues for the Data Processing Centre is to define, design and run a complete simulation of the Planck mission to test the data analysis pipelines. The simulation software must mimic the Planck observing procedure and any source of systematic effect. Moreover, it must cover all the aspects of the microwave sky. The simulation pipeline is then a fundamental test for the whole analysis infrastructure. It is the main tool to set the hardware requirements for the data processing computations.

MAGIC is an imaging atmospheric Cherenkov telescope that has been in operation since late 2004. The instrument, located on the Canary Islands, is used for astro-particle physics research and measures characteristics of atmospheric showers indicated by very high energy (VHE) electromagnetic particles, particularly gamma rays, hitting the upper atmosphere. Analysis of the data requires extensive simulation of VHE particles creating showers in the atmosphere. The first data challenge on the EGEE infrastructure began March 2005. Work to build a second telescope, on the same site on La Palma at 85m distance from MAGIC is currently in progress.

EGEE is keen to consider other applications. For further information on how to participate, as well as more information about the applications running on EGEE, visit the User and Application Portal at http://egeena4.lal.in2p3.fr/.

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