Contribution ID: **20**   Type: **Short Presentation by Participant**

Computing model for Large Cosmological Surveys and Simulations: PAU and MICE

Monday 30 May 2011 15:00 (20 minutes)

We present a computing model designed for two cosmological projects, the PAU survey and the MICE simulations.

The Physics of the Accelerating Universe (PAU) project aims at the study of the acceleration in the expansion of the universe. The PAU Team is building an instrument called PAUCam designed to be located at the William Herschel Telescope in La Palma. The camera will produce 200GB of Raw data per observing night for a total of 50TB and it will be transferred and stored at PIC in a nightly basis through the RedIRIS network.

The PAU data management group is developing a specific reduction software for the PAU data. The software is organized into different pipelines: pixel simulation, nightly reduction, quality analysis and multi-epoch.

The PAUdm software uses a combination of public (Astromatic) and self packages implemented in python. It has been designed in order to work both under a GRID environment and in a local PC (for community users) and to be flexible to accept data from external surveys. Parallelization is required due to time constraint allowing simultaneous image reduction. A PostgreSQL data base supports the control of all raw and processed data, providing access to the production catalogues for the PAU community.

The MICE (http://www.ice.cat/mice) cosmological simulations, produced at the Marenostrum Supercomputer of the Barcelona Supercomputer Center (BSC), have been transferred and stored at PIC. They serve as input for the pixel simulation, for the scientific error estimation and to optimize the survey strategy, the calibration and reduction pipelines and the photo-z analysis of the galaxy surveys in which we actively participate (PAU,DES,Euclid).

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Session Classification: Models in Surveys and Dark Energy experiments

Track Classification: Models for Computing and Data Pipelines