ID de Contribution: **35** Type: **Talk**

Atmospheric calibration and simulation of the cloud cover for the LSST survey

mercredi 12 juin 2013 15:10 (35 minutes)

High-priority science goals of the LSST mission such as weak lensing and baryon acoustic oscillations require exquisite knowledge of the density and spatial distribution of galaxies. The atmosphere can introduce photometric errors correlated on spatial scales of tens of arc-minutes where much of the power in these analyses is to be found. The LSST science requirements include a design specification of 10 mmag (stretch goal 5mmag) on the rms variation of the photometric zero-point across the sky, but this has been strengthened to require that errors of this magnitude not be spatially correlated. Furthermore, LSST is designed to observe even during non-perfectly photometric nights, to maximise the observing time. The calibration process must thus be robust to a broad variety of atmospheric conditions, including those prevailing during nights traditionally classified by astronomers as non photometric. This implies extensive simulations based on atmosphere transmission spectra reproducing the complexity of the real atmosphere with all its constituents and their variations in space and time, in so far as they affect light transmission. This is why the preparation of the calibration pipeline and simulation of atmosphere are of primary importance to prepare this survey. Several points concerning the atmospheric transmission have thus to be adressed in the current simulations to ensure we can meet the LSST science requirements : wavelength dependent extinction (see A. Boucaud's presentation) and so called gray extinction. Water droplets and ice crystals in clouds are relatively large compared to the wavelength of visible and NIR light, so the extinction due to cloud is independent of the wavelength. Nevertheless, the changes in spatial direction and time for the cloud cover are expected to be quick and the use of LSST during non strictly photometric nights makes it essential to integrate the cloud cover properly in the simulation package to prepare the LSST calibration pipeline. We will present here the plans for atmospheric monitoring and calibration of the LSST and focus particularily on this last point concerning cirrus cover monitoring and simulation.

Auteur principal: Mme ROUCELLE, Cécile (APC)

Orateur: Mme ROUCELLE, Cécile (APC)

Classification de Session: Wednesday afternoon 2

Classification de thématique: Simulations, modeling, and reconstruction