

The thermal Sunyaev-Zel'dovich effect with PLANCK

vendredi 22 juillet 2011 15:15 (15 minutes)

The PLANCK mission will provide the most precise measurement of the cosmic microwave background (CMB) anisotropies in temperature and polarization, allowing us to set tight constraints on the cosmological parameters. In addition, the PLANCK mission, because of its frequency coverage, is sensitive to the interaction of CMB photons and hot electrons in galaxy clusters via the thermal Sunyaev-Zel'dovich (tSZ) effect.

First, we present the reconstruction of the tSZ signal from a set of observed Planck maps at different frequency bands using an adapted component separation algorithm: MILCA.

Second, we will discuss the construction and validation process of the Planck Early Sunayev-Zeldovich (ESZ) based catalogue of clusters of galaxies. This catalogue will allow us to study in details the matter content of the universe and therefore to measure the matter power spectrum as a function of redshift and the properties of matter filaments.

Finally, we will demonstrate the complementarity of the PLANCK tSZ and X-ray observations of clusters of galaxies in order to characterize the properties and spatial distribution of the hot gas of electrons in galaxy clusters and galaxy cluster systems. The measured pressure profiles in galaxy clusters will allow us to constrain large scale structure formation theories.

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Classification de Session: Cosmology and Gravity