

Contributed Talk

Splinter CCAT

OBSERVATIONS OF THE RELATIVISTIC SZ EFFECT:
FROM *Planck* TO CCAT-P

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The Sunyaev-Zel'dovich (SZ) effect is a spectral distortion of the cosmic microwave background (CMB) due to inverse Compton scattering of CMB photons by free electrons in the hot plasma found in clusters of galaxies. Its signal is proportional to the line of sight integral of the thermal gas pressure and not dimmed with redshift. The SZ effect has been used extensively in the last two decades to detect and characterise galaxy clusters and has become an important tool for cosmology.

Due to the high temperatures of several keV found in the ICM, relativistic effects are expected to distort the SZ spectrum allowing to measure the temperature of the scattering gas. We attempt to measure these relativistic distortions by performing a stacking analysis of a large sample of galaxy clusters with data from the Planck mission. With its nine frequency channels, Planck allows to probe the entire spectrum of the SZ, making it ideally suited for this study. Of particular interest are high frequencies from 353 up to 857 GHz where the relativistic corrections are strongest but that are difficult to access with ground-based observatories. The main challenge in utilizing these frequencies is to separate the SZ signal from much brighter galactic foregrounds as well as far infrared emission from the clusters themselves.

We conclude by providing an outlook for the upcoming CCAT-p telescope, which will improve upon Planck with lower noise and better spatial resolution.