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Cluster cosmology with the NIKA2 camera at the IRAM 30-m telescope

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The main limiting factor of cosmological analyses based on thermal Sunyaev-Zel'dovich (SZ) cluster statistics comes from the bias and systematic uncertainties that affect the estimates of the mass of galaxy clusters. High-angular resolution SZ observations at high redshift are needed to study a potential redshift dependence of the cluster mass-observable scaling relation used in SZ cosmological analyses.

The NIKA2 camera is a new generation continuum instrument installed at the IRAM 30-m telescope. The combination of a large field of view (6.5 arcmin), a high angular resolution (17.7 arcsec), and a high-sensitivity of 8 mJy.s1/2 at 150 GHz provides the NIKA2 camera with unique SZ mapping capabilities. The NIKA2 SZ observation program will allow us to observe a large sample of clusters (50) at redshifts between 0.5 and 1.

I will present the characterization of the first NIKA2 SZ observations of a galaxy cluster at the IRAM 30-m telescope. I will then describe the ongoing SZ observation program with the NIKA2 camera and emphasize the synergy between the high quality NIKA2 SZ and XMM-Newton X-ray data for the calibration of the mass-obervable scaling relation at high redshift.

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