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Toward the first public release of the NIKA2 data within the Sunyaev-Zeldovich Large Program

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The Sunyaev-Zeldovich effect offers a powerful probe of the large-scale structures up to high redshifts. SZ-based cosmology, however, requires a precise characterization of cosmological tools such as a mass-observable scaling relation and a mean electronic pressure profile. Systematic effects, in particular at high redshift, have an impact on these tools and are currently the main limitation of cluster-based cosmology.

NIKA2, a millimeter camera installed at the IRAM 30-m telescope is a major experiment to extend our understanding of galaxy clusters. Combining sub-arcminute ($17.6''$ at 150 GHz) angular resolution and a $6.5'$ field-of-view diameter, NIKA2 can resolve and map the Sunyaev-Zel'dovich (SZ) effect towards clusters up to high redshifts. Combined with X-ray data from the XMM-Newton satellite, we can infer with high precision the thermodynamical properties and the hydrostatic masses of such objects within the NIKA2 SZ Large Program (LPSZ), which covers a representative sample of about 38 galaxy clusters at $0.5 < z < 0.9$.

In this talk I will present the method selected for the public release preparation of the NIKA2 data, going from the Time-Ordered Data quality assessment in map-making to obtaining electronic pressure and mass profiles of individual clusters. Then, I will discuss a new method to combine all individual estimates while accounting for their intrinsic scatter, to infer the mean pressure profile of clusters.

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