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## Coherent analysis of CMB primary and secondary anisotropies

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The Cosmic Microwave data at very small scales are known to probe not only primordial CMB fluctuations but also many extragalactic components such as tSZ, kSZ, CIB, points sources.

I will show how to use the cosmological dependent SZ signatures (tSZ and kSZ) at small scales coherently with the large scales and the cosmology framework in Planck and SPT experiments to retrieve both cosmological parameters and reionisation history. Using machine learning to compute efficiently the SZ angular power spectra, I will show new constraints obtained using SPT CMB observations combined with the latest Planck observed tSZ spectrum. I will discuss how such a coherent analysis could bring additional cosmological information and shed light on the  $\sigma_8$  tension observed between CMB and clusters.

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