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## Non-thermal pressure support in the MOO J1142+1527 cluster @ $z \sim 1.2$

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MOO J1142+1527 is the most massive,  $M_{500} = 6 \times 10^{14} M_{\odot}$  at  $z = 1.2$ , IR-selected cluster detected in the MaD-CoWS survey. According to the  $\Lambda$ CDM scenario, this type of object is expected to be extremely rare i.e.  $\sim 7$  objects as massive at  $z > 1.2$  according to the Planck cosmology.

The exceptional nature of this object and the large multi-wavelength data coverage represent an ideal laboratory to test our understanding of structure formation and evolution at such unprecedented redshift.

Building on the results of the work that combines Chandra and NIKA2, we perform for the first time combined X-ray-SZ analysis using a deep XMM observation tailored to obtain results up to  $R_{500}$ .

We present for the first time the investigation of the dynamical properties of this object up to  $R_{500}$  and the determination of the non-thermal pressure support at such redshift, combining high-resolution X-ray and SZ datasets.

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