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Surface brightness profiles of the CHEX-MATE galaxy cluster sample

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Galaxy clusters assembly through a hierarchical merging scenario. These processes leave an imprint on the gas which fills the cluster volume, namely the ICM. This component retains vital information on the cluster formation history.
X-ray surface brightness profiles are the most simple and direct tool to probe this component and their properties have been extensively studied in the literature, but for limited and/or biased samples. The advent of SZ all sky surveys allowed us to construct unbiased and representative sample of cluster.
We present the statistical properties of the surface brightness profiles of a representative sample of 118 clusters observed with high-quality and homogeneous XMM observations. We leverage this sample by studying for the first time the intrinsic scatter of the profiles for a real cluster population, contrasting our results with simulations. We also investigated the amount of dishomogeneity in the gas due to assembly processes in a unprecedented redshift and mass range.

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