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The dynamical state of the galaxy clusters in the CHEX-MATE sample

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The characterisation of the dynamical state of clusters is crucial for both astrophysical and cosmological studies. On the one hand, the most relaxed systems should provide the cleanest reconstruction of the cluster's intrinsic properties. On the other hand, disturbed systems are expected to bias (even significantly) this reconstruction. We use an analysis of the morphology of the X-ray emission, to assess the dynamical state of the clusters of the CHEX-MATE sample. This large, unbiased, signal-to-noise limited sample is composed of 118 objects and is built to become the reference for clusters in the local volume and in the high mass regime. With this study, we test the ability of a set of morphological parameters (concentration, centroid shift, smoothness, asymmetry, ellipticity and power-ratios) to determine the degree of relaxation or disturbance of clusters and we check our results applying the same procedure to a sample of simulated objects provided the Three Hundred collaboration. We present preliminary results of our analysis and a first assessment of the dynamical state in CHEX-MATE.

Primary authors: CAMPITIELLO, Maria Giulia (Unibo/INAF-OAS); ETTORI, Stefano (INAF OA Bologna); LOVISARI, Lorenzo

Presenter: CAMPITIELLO, Maria Giulia (Unibo/INAF-OAS)