



Contribution ID: 50

Type: not specified

Velocity dispersion vs cluster mass a new scaling law with The Three Hundred clusters

Thursday, 1 July 2021 10:20 (30 minutes)

The Planck Collaboration showed that the number of clusters as a function of their mass and redshift is an extremely powerful tool for Cosmological Analyses. However, the true cluster mass is not directly measurable. Therefore, we can estimate the cluster mass only through observables related to it called mass proxies. On the one hand, these observables are several and related to the various components of which a cluster is composed. On the other hand, the theoretical relations that allow the use of these proxies often do not take into account observational and physical biases, which makes difficult the determination of the cluster mass. Fortunately, Cosmological simulations are an extremely powerful tool to assess these problems. We present our calibration of the scaling relation between mass and velocity dispersion from the study of the simulated clusters of the THREE HUNDRED PROJECT with mass above $10^{13} M_{\text{sun}}$.

In order to investigate the redshift dependence of the parameter of the relation, we analyzed it in 19 different redshifts between $z = 0$ and $z = 2$. Finally, we investigated the effect of different AGN feedback models.

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