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Constraining AGN feedback model with the tSZ pressure profile

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Relativistic jets from AGN have a wide range of impacts on galaxy groups and clusters and are key for understanding their formation and physical properties. However, this non-gravitational process is not well understood. Galaxy groups with shallow gravitational potentials are ideal laboratories to study and constrain the AGN feedback model.

I studied hot gas in $\sim 66,000$ SDSS LRG halos with an average halo mass of $3 \cdot 10^{13} M_{\text{sun}}$ using the Planck tSZ map. I have detected their average tSZ radial profile at $\sim 17\sigma$ and compared it with the cosmo-OWLS cosmological hydrodynamical simulations with different AGN feedback models. The best agreement has been obtained for the AGN8.0 model in the simulations. I have also compared my measured tSZ profile with the prediction from the universal pressure profile and found them consistent if the model accounts for the clustering of neighboring haloes via a two-halo term. I will present these results.

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