

U12a Constraints on the cosmic baryon distribution with the FLIMFLAM survey

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Fast radio bursts (FRBs) are a promising new technique to probe the cosmic baryon distribution through their dispersion measures (DM), which can be further enhanced by combining with spectroscopic data of the foreground fields. I will introduce the FLIMFLAM survey, a wide field multi-object spectroscopic survey that targets the foreground galaxies of localized Fast Radio Bursts (FRBs). The goal of the survey is to independently constrain the total amount of cosmic baryons residing the IGM and CGM, as well as measure the mean host DM contribution.

On behalf of our collaboration, I will introduce new results that place the first-ever constraints on the relative fractions of cosmic baryons residing in the IGM and CGM, using the first data release (DR1) of the FLIMFLAM data which targets 9 FRBs. This is done by running MCMC analysis on models based on the observed foreground galaxy distribution, for which we have (i) reconstructed the matter density field using the Bayesian reconstruction code ARGONIS to calculate the IGM contribution and (ii) calculated the intervening CGM contribution of DM using a modified NFW model. Our results are the first time that the CGM gas fraction of $M_{halo} \sim 10^{12} - 10^{13} M_{\odot}$ galaxy halos has ever been measured. We will also publicly release our data to allow reproducibility of our results. Similar analysis of future data sets will allow us to detect the imprint of galaxy and AGN feedback on the cosmic baryon distribution.