X28a The diversity of IGM-galaxy connection at redshift $z = 2 - 3$

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The link between the intergalactic medium (IGM) and galaxies is key to understanding the evolution of baryonic matter and galaxies. Several observations in the literature have reported a correlation signal up to several tens of comoving Mpc between galaxies and Lyα forest absorption, a tracer of the neutral hydrogen gas (HI) in the IGM. Nonetheless, its variations over galactic properties, such as mass, SFR, and galaxy population, are not well understood. We calculate the cross-correlation function between galaxies and Lyα forest absorption and investigate its variations depending on galactic properties in order to deeply understand the IGM-galaxy connection in terms of galaxy evolution (Momose et al. 2021a, b, c). In this talk, we will present observational results obtained from publicly available IGM HI 3D tomography data, CLAMATO (Lee et al. 2016, 2018), and several galaxy catalogs. We will show similarities and differences in the correlation function among galaxy populations and discuss their Mpc scale HI environments reflecting different stages in galaxy evolution. We will also present a discordance between HI density distribution and galaxy distribution found only from LAEs.