Evolution of MgII CGM Kinematics Over 10 Billion Years

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Abstract

The flow of gas through galaxies is key to understanding the observed global properties and evolution of galaxies. This baryon cycle is expected to be most active at z=2-3, where the star formation rate density peaks. Extensive work has gone into characterizing baryon cycle gas as it moves through the circumgalactic medium (CGM) at low redshift, where low ionization gas traced by MgII absorption depends strongly on the galaxy star formation rate and is commonly associated with outflows and recycled accretion. However, little work has been done to characterize the MgII CGM at the epoch of peak baryon cycle activity. Using 1300 MgII absorbers in 480 high-resolution HIRES or UVES quasar spectra, we investigate the evolution of MgII CGM kinematics over z=0.1-2.6. We quantify the effect of larger star formation rates on CGM kinematics from the epoch of peak star formation and baryon cycle activity to nearly present day.

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