

Neutral Gas and Metals from $z=4.0$ to $z=0.5$

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Abstract

A complementary method to the emission selection of high-redshift galaxies consists in the observation of absorbers along the line of sight toward a background quasar. This selection technique has a constant sensitivity at all redshifts up to $z=6$ (i.e. no redshift desert) and allow to select all types of galaxies regardless of their luminosity or star formation rate. The highest column density absorbers, the Damped Lyman- α (DLAs) systems, in particular, can be used to determine the cosmic evolution of HI gas in the Universe, Ω_{HI} , and the global metallicity in the gas phase. Since stars are known to form from HI gas, Ω_{HI} provides a indirect tracer of the history of star formation. Measurements of Ω_{HI} and abundances at $z>2$ from a complete VLT sample of quasar absorbers will be reported. At $z<2$ (i.e. other the last 65% of the Universe look-back time), UV observations are required to study DLAs. Preliminary results from a pilot-study making use of GALEX spectroscopy to find DLAs will also be discussed. Finally, recent results from several parallel VLT programmes aiming at determining the cosmological evolution of the metallicity in the neutral gas phase will be presented.