J/MNRAS/456/4488 XQ-100 survey neutral gas (Sanchez-Ramirez+, 2016)

The evolution of neutral gas in damped Lyman α systems from the XQ-100 survey.

Sanchez-Ramirez R., Ellison S.L., Prochaska J.X., Berg T.A.M., Lopez S., D'odorico V., Becker G.D., Christensen L., Cupani G., Denney K.D., Paris I., Worseck G., Gorosabel J.

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=2016MNRAS.456.4488S (SIMBAD/NED BibCode)

ADC_Keywords: QSOs ; Redshifts ; Abundances

Keywords: galaxies: evolution - galaxies: formation - quasars: absorption lines - cosmology: observations

Abstract:

We present a sample of 38 intervening damped Lyman α (DLA) systems identified towards 100 z>3.5 quasars, observed during the XQ-100 survey. The XQ-100 DLA sample is combined with major DLA surveys in the literature. The final combined sample consists of 742 DLAs over a redshift range approximately $1.6<z_{abs}<5.0$. We develop a novel technique for computing Ω_{HI}^{DLA} as a continuous function of redshift, and we thoroughly assess and quantify the sources of error therein, including fitting errors and incomplete sampling of the high column density end of the column density distribution function. There is a statistically significant redshift evolution in Ω_{HI}^{DLA} (≥3σ) from z~2 to z~5. In order to make a complete assessment of the redshift evolution of Ω_{HI}, we combine our high-redshift DLA sample with absorption surveys at intermediate redshift and 21-cm emission line surveys of the local universe. Although Ω_{HI}^{DLA}, and hence its redshift evolution, remains uncertain in the intermediate-redshift regime ($0.1<z_{abs}<1.6$), we find that the combination of high-redshift data with 21-cm surveys of the local universe all yield a statistically significant evolution in Ω_{HI} from z~0 to z~5 (≥3σ). Despite its statistical significance, the magnitude of the evolution is small: a linear regression fit between Ω_{HI} and z yields a typical slope of $\sim0.17\times10^{-3}$, corresponding to a factor of ~4 decrease in Ω_{HI} between z=5 and z=0.

Description:

The XQ-100 survey is an ESO Large Program (ESO ID 189.A-0424, P.I. S. Lopez) which obtained X-shooter spectra of 100 3.5<z<4.7 QSOs in the period between 2012-02-10 and 2014-02-23. X-shooter is a triple-arm spectrograph which obtains moderate-resolution spectra with complete wavelength coverage from ~320-2500nm, permitting the simultaneous analysis of QSO absorption lines and emission features from the atmospheric cut-off to the near-IR.

Based on the results of the XQ-100 survey, we report the detection of 38 intervening DLAs identified towards 100 z>3.5 QSOs. This sample has been combined, after exhaustive checking for duplications and errors, with a literature sample of DLA surveys spanning the last ~20 years.

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
table1.dat	116	108	XQ-100 DLA catalog
table5.dat	84	5874	Combined sample catalogue

Byte-by-byte Description of file: table1.dat

Bytes	Format	Units	Label	Explanations
1- 2	A2	---	n_Name	[ABC] Note on Name (1)
4- 13	A10	---	Name	XQ-100 name (JHHMM+DDMM)
15- 20	F6.4	---	zem	? Emission redshift
23- 28	F6.4	---	zmin	? Minimum redshift range

31- 36	F6.4	---	zmax	? Maximum redshift range
39- 44	F6.4	---	zabs	? Absorption redshift
47- 51	F5.2	[cm-2]	logN(HI)	? HI column density
55- 58	F4.2	[cm-2]	e_logN(HI)	? rms uncertainty on logN(HI)
63-116	A54	---	Lines	Lines covered

Note (1): Note as follows:
A = DLA already identified in a previous survey
B = PDLA
C = color biased sight-line

Byte-by-byte Description of file: table5.dat

Bytes	Format	Units	Label	Explanations
1- 25	A25	---	QSO	QSO name
31- 39	F9.5	deg	RAdeg	Rigth ascension (J2000)
41- 48	F8.4	deg	DEdeg	Declination (J2000)
50- 54	F5.3	---	zem	?=- Emission redshift
56- 60	F5.3	---	zmin	?=- Minimum redshift range
62- 66	F5.3	---	zmax	?=- Maximum redshift range
68- 73	F6.4	---	zabs	?=- Absorption redshift
75- 79	F5.2	[cm-2]	logN(HI)	?=- HI column density
81- 84	F4.2	[cm-2]	e_logN(HI)	?=- rms uncertainty on logN

History:
From electronic version of the journal

(End) Patricia Vannier [CDS] 07-Oct-2016

*The document above follows the rules of the Standard Description for Astronomical Catalogues; from this documentation it is possible to generate **f77** program to load files into arrays or line by line*