

A Wide-field Multicolor Survey for High-Redshift Quasars, $z \geq 2.2$

(Warren, S. J., Hewett, P. C., and Osmer, P. S.)

Documentation for the Computer-Readable Version

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Abstract

In a wide-field multicolor survey (45.7 sq. deg., $16.0 \leq m_{or} \leq 20.0$) the authors discovered 130 new quasars, of which 100 are of redshift $z \geq 2.2$. There are 49 new quasars of redshift $z \geq 3.0$ including three of $z \geq 4.0$. The catalog provides spectra, coordinates, redshifts, broad-band magnitudes (u, b_j, v, or, r, i), line-equivalent widths for Lyman α /NV and CIV, and continuum spectral indices.

1 Introduction and Source Reference

1.1 Introduction

The goal of the wide-field multicolor survey for high-redshift (here $z \geq 2.2$) quasars is to constrain the quasar luminosity function and its evolution over the redshift interval $2.2 \leq z \leq 4.5$. The survey is based on the identification of stellar objects with colors different from those of common galactic stars, but redder in (U-B) than most low-redshift quasars. The raw data come from scans by the Automated Plate Measuring facility (APM) of pairs of United Kingdom Schmidt Telescope (UKST) direct plates in six passbands, u, b_j, v, or, r, i . The lowercase letters denote the natural photometric system defined by the UKST emulsion/filter combinations. The survey covers two fields, the south Galactic pole (SPG) at $0^h53^m - 28^\circ03'$ (1950.0) and UKST field F401 at $20^h48^m - 35^\circ03'$, for a total effective area 45.7 of square degrees. The respective magnitude ranges are $16.00 \leq m_{or} \leq 20.00$ and $16.00 \leq m_{or} \leq 19.82$.

Ninety-three new non-UVX quasars were discovered in the SGP field and 37 in F401. The catalog lists the details of these new quasars in right ascension order. The coordinates are accurate to about $1''$. Finding charts can be made available on request to Hewett. Three of the new SGP quasars were discovered independently by others. The equivalent widths (EWs) were measured in all cases where the complete line was included in the spectrum. This is also the case for the full width, half maximum (FWHM) C IV except that that quantity was not measured for the broad absorption-line (BAL) quasars. The measurement of the spectral index was limited to objects of redshift $z \geq 2.2$. The published paper contains the spectra.

Candidates for the catalog were selected by identifying outliers from the stellar sequence that exists in the six-dimensional parameter space defined by the six broad-band magnitudes. Lists of ~ 1000 candidates in each field (Lists A) that are redder than a specified limit $m_u - m_j$ (the non-ultraviolet excess) were compiled. Following an exploration of the contents of these lists, the sample was restricted, using precisely-defined criteria (List B), to objects farthest from the mean line, as well as candidates further down the lists that possess similar colors to the high-redshift quasars already discovered.

1.2 Source Reference

“A Wide-Field Multicolor Survey for High-Redshift Quasars, $z \geq 2.2$. II. The Quasar Catalog”
1991, Warren, S. J., Hewitt, P. C., and Osmer, P. S., ApJS, 76, 23

2 Structure

2.1 File Structure

The *The Wide-Field Survey for High-Redshift Quasars, $z \geq 2.2$ II. The Quasar Catalog* as distributed here is in a single fixed block file. It contains 130 records, each 129 bytes long. The four tables in the printed paper have been concatenated into one with the SGP field first, followed by F401 and all data for each quasar on a single line.

This information is sufficient for a user to describe the indigenous characteristics of the machine-readable version of the *The Wide-Field Survey for High-Redshift Quasars, $z \geq 2.2$ II The Quasar Catalog* to a computer. **A copy of this document should accompany any further distribution of this file.**

2.2 File Format

Table 1 gives a byte-by-byte description of the contents of the data file.

Bytes	Unit	Format	Item
2 - 9		A8	Number
12 - 13	deg	I2	RA ₁₉₅₀ , α
15 - 16	min	I2	α
18 - 22	sec	F5.2	α
24 - 26	°	I3	Dec ₁₉₅₀ , δ
28 - 29	'	I2	δ
31 - 34	"	F4.2	δ
36 - 39	year	I4	Date of observation
41 - 43	month	A3	Date of observation
45 - 46	day	I2	Date of observation
48		A1	Telescope
50 - 53		F4.2	z
54		A1	Uncertainty code for z
56		A1	List A
60		A1	List B
63 - 65		A3	Plot no.
67 - 72	mag	A6	m_u
74 - 79	mag	A6	m_{bj}
81 - 86	mag	A6	m_v
88 - 92	mag	F5.2	m_{or}
94 - 98	mag	F5.2	m_r
100-105	mag	A6	m_i
107-110	Å	A4	Eq. width $Ly\alpha/NV$
112-117	Å	A6	Eq. width CIV
119-121	Å	A3	FWHM CIV
124-129		A5	Spectral index

Table 1: Format

3 Notes to the Catalog

Telescope: A = AAT, C = CTIO 4 m.

0043-296 is also in Boyle et al. 1990 and Anderson et al. 1991.

0049-286 and 0052-297 are also in Anderson et al. 1991.

The redshift of 0043-275 is incorrectly stated in Warren et al. 1987a.

0100-283A is classified as marginally non-stellar.

0100-292 is fainter than the sample limit.

When two values are given for the equivalent width, they are BAL emission/absorption EW.

The spectral index for 0101-304 is taken from Schneider, Schmidt, & Gunn 1989.

The spectral indices for the objects in field F401 have been dereddened.

4 Acknowledgments

We thank Dr. Warren for forwarding to us a machine-readable version of the catalog.

5 References

“A Wide-Field Multicolor Survey for High-Redshift Quasars, $z \geq 2.2$. II. The Quasar Catalog”
Warren, S. J., Hewitt, P. C., and Osmer, P. S., 1991, ApJS, 76, 23