J/A+A/620/A118 Highly Accreting Quasars: SDSS Low z Catalog (Negrete+, 2018)

Highly accreting quasars: The SDSS low-redshift catalog.
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Abstract:
The most highly accreting quasars are of special interest in studies of the physics of active galactic nuclei (AGNs) and host galaxy evolution. Quasars accreting at high rates (L/LEdd~1) hold promise for use as "standard candles": distance indicators detectable at very high redshift. However, their observational properties are still largely unknown.

We seek to identify a significant number of extreme accretors. A large sample can clarify the main properties of quasars radiating near L/LEdd~1 (in this paper they are designated as extreme Population A quasars or simply as extreme accretors) in the Hβ spectral range for redshift ≲0.8.

We use selection criteria derived from four-dimensional Eigenvector 1 (4DE1) studies to identify and analyze spectra for a sample of 334 candidate sources identified from the SDSS DR7 database. The source spectra were chosen to show a ratio R_{FeII} between the FeII emission blend at λ4570 and Hβ, R_{FeII} > 1. Composite spectra were analyzed for systematic trends as a function of FeII strength, line width, and [OIII] strength. We introduced tighter constraints on the signal-to-noise ratio (S/N) and R_{FeII} values that allowed us to isolate sources most likely to be extreme accretors.

We provide a database of detailed measurements. Analysis of the data allows us to confirm that Hβ shows a Lorentzian function with a full width at half maximum (FWHM) of Hβ≲4000km/s. We find no evidence for a discontinuity at 2000km/s in the 4DE1, which could mean that the sources below this FWHM value do not belong to a different AGN class. Systematic [OIII] blue shifts, as well as a blueshifted component in Hβ are revealed. We interpret the blueshifts as related to the signature of outflowing gas from the quasar central engine. The FWHM of Hβ is still affected by the blueshifted emission; however, the effect is non-negligible if the FWHM Hβ is used as a "virial broadening estimator" (VBE). We emphasize a strong effect of the viewing angle on Hβ broadening, deriving a correction for those sources that shows major disagreement between virial and concordance cosmology luminosity values.

The relatively large scatter between concordance cosmology and virial luminosity estimates can be reduced (by an order of magnitude) if a correction for orientation effects is included in the FWHM Hβ value; outflow and sample definition yield relatively minor effects.

Description:
Table 4: contains 103 spectra with an erroneous z identification. The redshift values are given by: the SDSS database (erroneous values), Shen et al. (2011, Cat. J/ApJS/194/45) and Hewett & Wilde (2010, Cat. J/MNRAS/405/2302) (correct values).

Table 5: Contains the data described in the Table 2, which are the measurements of the individual spectral fits and derived computations. A detailed description of this table is in Sec. 4.2.

File Summary:

FileName	Lrecl	Records	Explanations
ReadMe	80	.	This file
table1.dat	51	101	Objects with an erroneous z identification
table2.dat	543	302	Measurements of the individual spectral fits

See also:
J/MNRAS/405/2302 : Improved redshifts for SDSS quasar spectra (Hewett+, 2010)
J/ApJS/194/45 : QSO properties from SDSS-DR7 (Shen+, 2011)

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

Bytes	Format	Units	Label	Explanations
1- 19	A19	---	SDSS	SDSS Name
21- 27	F7.5	---	zSDSS	SDSS DR7 redshift
29- 35	F7.5	---	e_zSDSS	SDSS redshift error
37- 43	F7.5	---	zShen	Shen et al. (2011, Cat. J/ApJS/194/45) redshift
45- 51	F7.5	---	zHW	Hewitt & Wilde (2010, Cat. J/MNRAS/405/2302) redshift

Byte-by-byte Description of file: table2.dat

Bytes	Format	Units	Label	Explanations
1- 19	A19	---	SDSS	SDSS DR7 designation
21- 27	F7.5	---	z	Redshift considered in this work (1)
29- 35	F7.5	---	e_z	Redshift error
37- 43	F7.5	---	zSDSS	Redshift SDSS DR7
45- 51	F7.5	---	e_zSDSS	Redshift SDSS DR7 error
53- 57	F5.2	---	S/N	S/N ratio measured around 5100Å
59- 62	F4.2	10-19W/m2/nm	C5100	Continuum flux at 5100Å in 10^{-17}erg/cm^2/s/Å
64- 67	F4.2	10-19W/m2/nm	e_C5100	Continuum flux at 5100Å error
69- 73	F5.1	---	N5100	Continuum normalization at 5100Å
75- 79	F5.2	---	e_N5100	Continuum normalization at 5100Å error
81- 85	F5.2	---	alpha	Power law index
87- 90	F4.2	---	e_alpha	Power law index error
92	I1	---	FaintHG	Faint contribution of the HG
94-101	F8.2	10-20W/m2	FHbBC	Hβ_{BC} line flux in 10^{-17}erg/cm^2/s
103-109	F7.2	10-20W/m2	e_FHbBC	Hβ_{BC} line flux error
111-115	F5.2	0.1nm	EWHbBC	Hβ_{BC} rest-frame equivalent width
117-121	F5.2	0.1nm	e_EWHbBC	Hβ_{BC} rest-frame equivalent width error
123-127	I5	km/s	ShiftHbBC	Hβ_{BC} shift with respect to the rest-frame
129-133	F5.1	km/s	e_ShiftHbBC	Hβ_{BC} shift with respect to the rest-frame error
135-142	F8.3	km/s	FWHMHbBC	Hβ_{BC} FWHM
144-151	F8.3	km/s	e_FWHMHbBC	Hβ_{BC} FWHM error
153	A1	---	Hbprofile	[GL] G = Gaussian, L = Lorentzian
155-161	F7.2	10-20W/m2	FHbblue	HβBLUE Line Flux
163-168	F6.2	10-20W/m2	e_FHbblue	HβBLUE Line Flux error
170-174	F5.2	0.1nm	EWHbblue	HβBLUE rest-frame equivalent width
176-179	F4.2	0.1nm	e_EWHbblue	HβBLUE rest-frame equivalent width error
181-188	F8.2	km/s	ShiftHbblue	HβBLUE shift
190-196	F7.2	km/s	e_ShiftHbblue	HβBLUE shift error
198-201	I4	km/s	FWHMHbblue	HβBLUE FWHM
203-206	I4	km/s	e_FWHMHbblue	HβBLUE FWHM error
208-215	F8.2	10-20W/m2	FFeII	FeII flux
217-223	F7.2	10-20W/m2	e_FFeII	FeII flux error
225-230	F6.2	0.1nm	EWFeII	FeII rest-frame equivalent width
232-235	F4.1	0.1nm	e_EWFeII	FeII rest-frame equivalent width error
237-240	A4	---	Pop	Population designation
242-246	F5.3	---	RFeII	Ratio between the FeII emission blend at λ4570 and Hβ
248-252	F5.3	---	e_RFeII	RFeII error
254-259	F6.3	---	AIHb	Hβ asymetry (only objects with Hbblue)
261-265	F5.3	---	e_AIHb	Hβ asymetry error
267-270	F4.2	---	Kurt	Kurtosis
272-275	F4.2	---	e_Kurt	Kurtosis error
277-281	I5	km/s	C010	Hβ centroid at 0.10 of the line intensity
283-286	I4	km/s	e_C010	Hβ centroid at 0.10 of the line intensity error
288-291	I4	km/s	C025	Hβ centroid at 0.25 of the line intensity
293-295	I3	km/s	e_C025	Hβ centroid at 0.25 of the line intensity error
297-300	I4	km/s	C050	Hβ centroid at 0.50 of the line intensity
302-304	I3	km/s	e_C050	Hβ centroid at 0.50 of the line intensity error
306-309	I4	km/s	C075	Hβ centroid at 0.75 of the line intensity
311-313	I3	km/s	e_C075	Hβ centroid at 0.75 of the line intensity error
315-318	I4	km/s	C090	Hβ centroid at 0.90 of the line intensity
320-322	I3	km/s	e_C090	Hβ centroid at 0.90 of the

				line intensity error
324-329	F6.2	10-20W/m2	FHeII	HeII line flux
331-335	F5.2	10-20W/m2	e_FHeII	HeII line flux error
337-344	F8.2	km/s	ShiftHeII	HeII shift with respect to the rest frame
346-352	F7.2	km/s	e_ShiftHeII	HeII shift with respect to the rest frame error
354-357	I4	km/s	FWHMHeII	HeII FWHM
359-362	I4	km/s	e_FWHMHeII	HeII FWHM error
364-369	F6.2	10-20W/m2	FHbNC	Hβ_{NC} Line Flux
371-375	F5.2	10-20W/m2	e_FHbNC	Hβ_{NC} Line Flux error
377-380	F4.2	0.1nm	EWHbNC	Hβ_{NC} rest-frame equivalent width
382-385	F4.2	0.1nm	e_EWHbNC	Hβ_{NC} rest-frame equivalent width error
387-388	I2	km/s	ShiftHbNC	Hβ_{NC} shift with respect to the rest-frame
390-394	F5.1	km/s	e_ShiftHbNC	Hβ_{NC} shift with respect to the rest-frame error
396-399	I4	km/s	FWHMHbNC	Hβ_{NC} FWHM
401-403	I3	km/s	e_FWHMHbNC	Hβ_{NC} FWHM error
405-411	F7.2	10-20W/m2	FOIII	Line flux of [OIII] 5007
413-419	F7.2	10-20W/m2	e_FOIII	Line flux error of [OIII] 5007
421-425	F5.2	0.1nm	EWOIII	Line [OIII] 5007 rest-frame equivalent width
427-431	F5.2	0.1nm	e_EWOIII	Line [OIII] 5007 rest-frame equivalent width error
433-440	F8.2	km/s	ShiftOIII	Line [OIII] 5007 shift with respect to the rest-frame
442-447	F6.2	km/s	e_ShiftOIII	Line [OIII] 5007 shift with respect to the rest-frame error
449-452	I4	km/s	FWHMOIII	Line [OIII] 5007 FWHM
454-457	I4	km/s	e_FWHMOIII	Line [OIII] 5007 FWHM error
459-465	F7.2	10-20W/m2	FOIIISB	Semi broad line [OIII] 5007 flux
467-473	F7.2	10-20W/m2	e_FOIIISB	Semi broad line [OIII] 5007 flux error
475-479	F5.2	0.1nm	EWOIIISB	Semi broad line [OIII] 5007 rest-frame equivalent width
481-485	F5.2	0.1nm	e_EWOIIISB	Semi broad line [OIII] 5007 rest-frame equivalent width error
487-494	F8.2	km/s	ShiftOIIISB	Semi broad line [OIII] 5007 shift with respect to the rest frame
496-501	F6.2	km/s	e_ShiftOIIISB	Semi broad line [OIII] 5007 shift with respect to the rest frame error
503-506	I4	km/s	FWHMOIIISB	Semi broad line [OIII] 5007 FWHM
508-511	I4	km/s	e_FWHMOIIISB	Semi broad line [OIII] 5007 FWHM error
513-516	F4.2	[Msun]	logMBH	Black hole mass
518-521	F4.2	[Msun]	e_logMBH	Black hole mass error
523-527	F5.2	[Lsun]	logLBol	Bolometric luminosity
529-532	F4.2	[Lsun]	e_logLBol	Bolometric luminosity error
534-538	F5.2	---	L/LEdd	Eddington ratio
540-543	F4.2	---	e_L/LEdd	Eddington ratio error

Note (1): measured using the Hβ_{NC} or [OIII]λ5007 line (see text).

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(End) Patricia Vannier [CDS] 10-Sep-2018

*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*