UDC 524.7-126 *Astrofiz. Issled. (Izv. SAO)*, 1993, 36, 5-42

SPECTRAL INVESTIGATIONS OF OBJECTS FROM THE SECOND BYURAKAN SURVEY. STELLAR OBJECTS. VI

J.A. STEPANIAN, V.A. LIPOVETSKY,
Special Astrophysical Observatory of the Russian AS,
Nizhnij Arkhyz 357147, Russia

V.H. CHAVUSHIAN, L.K. ERASTOVA, S.K. BALAYAN
Byurakan Astrophysical Observatory of the Armenian AS,
Byurakan 378433, Armenia

Received October 8, 1992

ABSTRACT. *The data for 100 QSOs from the Second Byurakan Survey (SBS) located on the northern sky $8^h < \alpha < 17^h$ and $49^\circ < \delta < 61^\circ$ are presented.*

The main parameters of emission lines and the other data for all QSOs as well as their scans are given.

Totally we have found 216 QSOs in SBS.

INTRODUCTION

This is the sixth paper of this series. In the first five papers (Stepanian et al., 1990a,b,c; 1991a,b) we have presented spectral data for 156 stellar objects, located in six fields of the SBS, and for 47 stellar objects, located beyond the published SBS fields in the sky region $8^h < \alpha < 17^h$ and $49^\circ < \delta < 61^\circ$. In the mentioned region we have discovered 116 QSOs, one LINER, seven Sy1 galaxies, one Sy2 galaxy and five emission-line galaxies as well.

In this paper we present spectral and other data on the next 100 quasistellar objects. Three objects SBS 1011+465, SBS 1107+487 and SBS 1307+462, located in the zone bordering on the SBS region, are also listed.

All spectra have been obtained at the 6 m telescope with the 1024-channel TV scanner (IPCS) in the spectral range 3500-6800 ÅÅ with a spectral resolution of 10-15 Å and the diaphragm 1.5-2″. One or two standard stars were observed every night excluding the bad weather conditions. The method of observations, sampling, classification and data processing are presented by Stepanian et al. (1990a).

DISCUSSION THE RESULTS

In Table 1 we collected together the data on the investigated objects: 1 - SBS designation, 2 and 3 - equatorial coordinates with an accuracy to one minute of arc for epoch 1950, 4 - date of observations, 5 - spectral range in angstroms, 6 - exposure time in seconds, 7- visual estimates of apparent magnitude in the blue band (B), 8 - survey type.

Table 2 presents the measurement results of emission line parameters for QSOs: 1 - SBS designation, 2 - visual estimate of the apparent magnitude in blue band (B), 3 - absolute magnitude calculated using equation from (Schmidt and Green, 1983) for H=50 $km \cdot s^{-1} Mpc^{-1}$, $q_0=0$, $M_B=B-5\log z(1+z/2)+2.5(1+\alpha)\log(1+z)-43.89$, and $\alpha=-0.7$, 4 - mean value of the redshift determined due to the strong emission lines, 5 - observed wavelength of emission line, 6 and 7 - laboratory wavelength of emission line of ion and the ion, 8 - total width of emission line at the level of continuum FWOI (km/s), 9 - total width of emission line at half intensity (maximum) FWHM (km/s), 10 - observed value of equivalent width of emission line EW_{obs} (Å).

In a few cases depending on redshifts, some emission lines located near the end of the spectra, where the spectra were too deep and we could not fit the right level of continuum, therefore for these objects the values of FWOI, FWHM and EW in fact are more uncertain than for others, for some of them we can't give their parameters .

We have given the mean values for the quantities listed in Table 2, when several spectra for one object are available. The sign colon implies uncertain determination of a parameter. It can be seen from Table 2 that the range of apparent magnitudes $15^m.5 \leqslant m_B \leqslant 19^m.5$. The range of redshifts of QSOs is $0.150 \leqslant z_{em} \leqslant 3.150$, luminosities are in the interval $-23^m.3 \leqslant M_B \leqslant -31^m.1$.

In Figs. 1-25 the scans of all QSOs are presented. The finding charts for all objects will be published later in general SBS Catalogue.

Table 1.

Designation SBS	Coordinates α_{1950}	δ_{1950}	Date	Spectral range	Exposure (s)	m_B	Survey type
1	2	3	4	5	6	7	8
0747+553	$07^h47.^m4$	$+55^\circ19'$	16.11.90	3300-6700	1788	17^m	BSO
0754+606	07 54.0	+60 37	10.01.92	3300-7000	675	19	BSO
0806+505	08 06.4	+50 34	07.11.91	3200-6900	457	17	BSO
0816+598	08 16.1	+59 52	07.11.91	3200-6900	1265	17	BSO
0817+573	08 17.7	+57 22	08.04.91	3200-6900	346	17	BSO
			07.11.91	3200-6900	383		
0818+602	08 18.0	+60 13	06.03.92	3400-7100	1045	17.5	QSO:
0818+506	08 18.3	+50 39	07.11.91	3200-6900	263	17.5	QSO:
0832+606	08 32.4	+60 40	07.11.91	3200-6900	293	18.5	QSO:
0839+541	08 39.4	+54 09	08.04.91	3300-6900	377	16.5	QSO
0852+601	08 52.9	+60 09	07.11.91	3200-6900	365	17	BSO
0910+507	09 10.6	+50 47	10.11.91	3400-7100	389	17	BSO
0910+586	09 10.7	+58 37	07.11.91	3200-6900	195	17	BSO
0920+590	09 20.5	+59 04	10.11.91	3400-7100	509	17	BS
0921+587	09 21.5	+58 44	08.01.91	3300-7000	1153	17	BSO
0921+549	09 21.6	+54 57	07.11.91	3200-6900	933	16.5	BS
0929+521	09 29.4	+52 09	06.04.91	3500-7000	731	17	QSO
0935+515 A	09 35.3	+51 34	07.11.91	3200-6200	438	18	BSO
0938+600	09 38.0	+60 03	10.11.91	3400-7100	1467	16.5	BSO
0938+505	09 38.1	+50 32	07.11.91	3200-6900	432	19.5	QSO
0941+583	09 41.1	+58 23	10.11.91	3400-7100	449	17.5	BSO
0948+515 A	09 48.4	+51 34	26 11.87	3500-6800	1038	19	BSO
0949+522	09 49.2	+52 12	07.11.91	3200-6900	403	18	BSO
0949+527	09 49.7	+52 43	07.11.91	3200-6900	376	18	BSO
0955+514	09 55.4	+51 24	09.04.91	3400-7000	304	17.5	BS
0957+588	09 57.7	+58 50	09.01.91	3300-7000	970	17	BSO
0959+580	09 59.1	+58 03	09.01.91	3300-7000	901	17	BSO
1004+503	10 04.6	+50 22	10.11.91	3400-7100	598	16.5	BSO
1007+573	10 07.4	+57 21	08.04.91	3400-7000	370	17	BSO
1011+465	10 11.0	+46 35	11.04.91	3400-7000	643	16.5	BSO
1014+565	10 14.0	+56 35	10.11.91	3400-7100	625	17	BSO
1018+517	10 18.6	+51 45	05.02.92	3300-7000	585	17	BSO
1020+553 B	10 20.9	+55 20	10.11.91	3400-7100	526	17	BSO
1024+562	10 24.3	+56 13	10.01.92	3300-7000	557	17	BSO
1031+558	10 31.6	+55 53	10.01.92	3300-7000	559	17.5	BSO
1036+490	10 36.3	+49 04	10.11.91	3400-7100	477	16	BS
1052+518	10 52.7	+51 53	10.01.92	3300-7000	796	17.5	BSO
1059+599	10 59.8	+59 58	10.01.92	3300-7000	436	17.5	BSO
1102+536	11 02.9	+53 36	10.01.92	3300-7000	557	17	BS
1107+487	11 07.8	+48 47	04.04.92	3300-7000	282	16	QSO
1108+511	11 08.3	+51 09	10.01.92	3300-7000	1172	17.5	BSO
1112+515	11 12.3	+51 35	10.01.92	3300-7000	855	16.5	BS
1116+610	11 16.6	+61 05	06.04.92	3300-7000	686	18.5	QSO
1133+555	11 33.7	+55 35	04.04.92	3300-7000	516	17	BSO
1136+575	11 36.0	+57 30	06.04.92	3300-7000	601	18.5	QSO
1152+523	11 52.6	+52 19	25.03.92	3300-7000	1558	16.5	BSO
1201+524	12 01.3	+52 27	25.02.92	3400-7100	333	15.5	BS
1213+549 A	12 13.5	+54 58	14.12.85	3500-5300	2680	16.5	BSO
1216+505	12 16.2	+50 34	15.04.91	3500-7000	447	17	QSO
1217+499	12 17.0	+49 56	04.04.92	3300-7000	437	17	BSO
1240+545	12 40.4	+54 35	20.03.91	3300-7100	409	17	QSO

Table 1 (continued)

1	2	3	4	5	6	7	8
1247+527	12 47.3	+52 47	05.03.92	3400-7100	446	16	BS
1249+503	12 49.8	+50 20	20.03.91	3300-7100	505	17	QSO
1303+532	13 03.7	+53 17	25.03.92	3300-7000	585	17	BSO
1303+583	13 03.9	+58 20	02.04.92	3300-7000	445	17	BSO
1307+462	13 07.9	+46 17	06.04.91	3400-7000	185	16	QSO
1309+512	13 09.0	+51 17	06.04.91	3400-7000	275	17	QSO
1312+495	13 12.6	+49 31	03.04.92	3300-7000	1406	17	BSO
1315+577	13 15.6	+57 46	20.03.91	3400-7100	441	17	QSO
1323+566	13 23.1	+56 38	04.04.92	3300-7000	393	17	BS
1326+529	13 26.3	+52 59	06.03.92	3400-7100	613	16.5	BSO
1335+593	13 35.6	+59 21	04.04.92	3300-7000	499	17	BSO
1337+542	13 37.4	+54 11	04.04.92	3300-7000	396	17	BSO
1341+576	13 41.8	+57 38	15.04.91	3400-7000	833	17.5	QSO
1342+560	13 42.8	+56 02	21.02.90	3300-7000	978	16	QSO
1349+575	13 49.2	+57 32	06.04.91	3400-7000	326	17	QSO
1351+549	13 51.5	+54 59	10.04.91	3500-7000	468	18	BSO
1353+564 A	13 53.5	+56 27	10.04.91	3500-7000	858	17	BSO
1357+562	13 57.4	+56 12	10.04.91	3400-7000	327	17.5	QSO
1359+558	13 59.0	+55 50	07.03.92	3400-7100	1652	16.5	BSO
1400+564	14 00.5	+56 24	20.03.91	3500-7100	1568	17.5	QSO
1406+492	14 06.6	+49 16	06.04.92	3300-7000	548	17	QSO
1407+559	14 07.1	+55 59	10.04.91	3400-7000	447	18.5	BSO
1408+544	14 08.4	+54 26	10.04.91	3400-7000	427	17.5	BSO
1413+538 A	14 13.6	+53 50	10.04.91	3300-7000	495	17.5	BSO
1417+596	14 17.8	+59 36	12.07.91	3500-7100	882	18	QSO
1419+538	14 19.0	+53 50	20.03.91	3300-7100	424	17	QSO
1421+511	14 21.5	+51 10	29.02.92	3400-7100	546	17	NSO
1424+502	14 24.4	+50 16	29.02.92	3400-7100	604	17.5	QSO
1426+506	14 26.5	+50 41	07.03.92	3400-7100	1456	16.5	BSO
1437+509	14 37.2	+50 54	12.07.91	3400-7100	845	17	QSO
1439+522	14 39.2	+52 17	05.04.92	3300-7000	598	16.5	QSO
1458+534	14 58.2	+53 25	06.04.91	3400-7000	293	17.5	QSO
1500+557	15 00.3	+55 45	10.07.91	3400-7000	1272	17	BSO
1501+506	15 01.6	+50 40	07.03.92	3400-7100	437	16.5	BS
1503+570	15 03.6	+57 01	05.04.92	3300-7000	1334	17	BSO
1504+543	15 04.7	+54 23	05.04.92	3300-7000	500	17	QSO
1508+585	15 08.8	+58 33	05.04.92	3300-7000	830	17	BSO
1509+522	15 09.5	+52 15	05.04.92	3300-7000	1500	17	BSO
1510+517	15 10.0	+51 47	20.03.91	3400-7100	347	17	QSO
1518+497	15 18.6	+49 42	07.03.92	3400-7100	512	17.5	QSO:
1521+598	15 21.0	+59 51	03.09.86	3500-6700	2145	17.5	QSO
1526+540	15 26.6	+54 03	06.04.92	3300-7000	373	17	QSO
1527+522	15 27.3	+62 15	06.04.92	3300-7000	571	16	QSO
1527+530	15 27.7	+53 03	06.04.92	3300-7000	469	17	BSO
1532+588	15 32.8	+58 50	28.08.87	3300-6600	2097	18.5	BSO
			23.09.90	3400-6900	2106		
1534+528	15 34.6	+52 53	10.07.91	3400-7000	1397	17	BSO
1543+593	15 43.2	+59 21	26.02.88	3200-6800	577	17	QSO
			03.10.88	3300-5300	1455		
1551+572	15 51.5	+57 16	23.09.90	3500-6900	2123	18	QSO
1555+553	15 55.1	+55 17	27.09.90	3400-7100	2689	17	BSO
1624+566	16 24.9	+56 34	06.04.92	3300-7000	586	17.5	BS

Table 2

Designation SBS	m_B	M_B	z_{em}	λ_{obs}	λ_o	Identification	FWOI km/s	FWHM km/s	EW_{obs}
1	2	3	4	5	6	7	8	9	10
0747+553	17^m	-24.5	0.302	3640	2798	MgII	15000	6800	100
				4460	3426	[NeV]	-	-	-
				4860	3727	[OII]	-	-	-
				5030:	3869	[NeIII]	-	-	-
				6330	4861	H_β	-	-	-
				6455:	4959	[OIII]	-	-	-
				6520	5007	[OIII]	-	-	-
0754+606	19	-27.2	1.771	3370	1216	L_α+NV	-	-	-
				3880	1400	SiIV +[OIV]	-	-	-
				4290	1549	CIV	10000:	5000:	50:
				5300	1909	CIII]	8000:	4000:	45:
0806+505	17	-28.1	1.205	4210	1909	CIII]	3800:	1900:	15:
				6170	2798	MgII	6900	3500	30
0816+598	17	-25.0	0.368	3830	2798	MgII	4200	2100	10
				4005	2931	[MgV]	-	-	-
				4710	3444	[OIII]	-	-	-
				5090	3727	[OII]	-	-	-
				5955	4363	[OIII]+H_γ	-	-	-
				6640	4861	H_β	7200	3600	60
				6845	5007	[OIII]	-	-	-
0817+573	17	-28.8	1.537	3555	1400	SiIV+[OIV]	-	-	-
				3930	1549	CIV	10700	5400	30
				4845	1909	CIII]	6500	3200	20
0818+602	17.5	-28.2	1.523	3910	1549	CIV	12200	6100	100
				4815	1909	CIII]	11000	5500	70
0818+506	17.5	-29.2	2.139	3820	1216	L_α+NV	24000:	12000:	200:
				4395	1400	SiIV+[OIV]	-	-	-
				4860	1549	CIV	11000:	5500:	60:
				5995:	1909	CIII]	-	-	-
0832+606	18.5	-27.8	1.846	3465	1216	L_α	-	-	-
				3530	1240	NV		-	
				3980	1400	SiIV+[OIV]	13200	6600	50
				4405	1549	CIV	9600	4800	80
				5435	1909	CIII]	3700	4800	65
0839+541	16.5	-24.2	0.217	3405	2798	MgII	4700:	2300:	35:
				4170	3426	[NeV]	-	-	-
				4540	3727	[OII]	-	-	-
				4720	3869	[NeIII]	-	-	-
				5285	4340	H_γ	-	-	-
				5915	4861	H_β	12800	3600	140
				6035	4959	[OIII]	-	-	-
				6100	5007	[OIII]	-	-	-
0852+601	17	-24.4	0.292	3615	2798	MgII	11600	5800	50
				3840:	2973	[NeV]	-	-	-
				6280	4861	H_β	-	-	-

Table 2. (continued)

1	2	3	4	5	6	7	8	9	10
0910+507	17	-23.4	0.188	4715	3968	[NeIII]+H_ε	-	-	-
				4875	4101	H_δ	3200	1600	10
				5180	4363	H_γ+[OIII]	4100	2050	25
				5780	4861	H_β	5500	2750	60
				5585	4959	[OIII]	-	-	-
				5955	5007	[OIII]	-	-	-
0910+586	17	-29.5	1.951	3590	1216	L_α	-	-	-
				3660	1240	NV	-	-	-
				4130	1400	SiIV+[OIV]	-	-	-
				4570	1549	CIV	10400	5200	60
				5635	1909	CIII]	-	-	-
0920+590	17	-26.6	0.714:	3870	2798	MgII	3300	1600	20
0921+587	17	-25.1	0.384:	3870	2798	MgII	8200	4100	40
				4745:	3426	[NeV]	-	-	-
				6405	4340	H_γ	-	-	-
0921+549	16.5	-26.1	0.476:	4130	2798	MgII	5200	2600	10
0929+521	17	-30.3	2.584	4360	1216	L_α	22000	2500	700
				4445	1240	NV		-	
				4680:	1306	OI+SiII	-	-	-
				5550	1549	CIV	9600	4800	150
0935+515 A	18	-25.0	0.564:	4375	2798	MgII	4800	2400	25
0938+600	16.5	-28.0	0.966	3755	1909	CIII]	-	-	-
				5500	2798	MgII	4800	2400	15
0938+505	19.5	-27.2	2.097	3765	1216	L_α	-	-	-
				3840	1240	NV	-	-	-
				4335	1400	SiIV+[OIV]	-	-	-
				4795	1549	CIV	-	-	-
0941+583	17.5	-26.1	0.707:	4775	2798	MgII	7800	3900	35
0948+515 A	19	-23.9	0.524:	4265	2798	MgII	7000	3500:	40
0949+522	18	-24.2	0.410	3945	2798	MgII	8000:	4000:	20:
				6125	4340	H_γ	-	-	-
				6855	4861	H_β	-	-	-
0949+527	18	-28.4	1.880	3520	1216	L_α+NV	-	-	-
				4020	1400	SiIV+[OIV]	-	-	-
				4460	1549	CIV	9500	4700	40
				5510	1909	CIII]	-	-	-
0955+514	17.5	-24.6	0.392	3895	2798	MgII	8000	3000	70
				4460	3203	[HeII]	3500:	2000:	10:
				5710	4102	H_δ	4000	2000	30
				6045	4340	H_γ	6000	3000	70
0957+588	17	-29.4	1.916	3535	1216	L_α	-	-	-
				4085	1400	SiIV+[OIV]	-	-	-
				4540	1549	CIV	-	-	-
0959+580	17	-26.7	0.723:	4820	2798	MgII	6600	3300	30
1004+503	16.5	-24.2	0.213	4970	4102	H_δ	5400:	2700:	15
				5265	4340	H_γ	7000	3500	25
				5680	4686	HeII	-	-	-

Table 2. (continued)

1	2	3	4	5	6	7	8	9	10
				5895	4862	H_β	7200:	3600:	75:
				6020	4959	[OIII]	-	-	-
				6085	5007	[OIII]	-	-	-
1007+573	17	-29.8	1.956	3595	1216	L_α+NV	19000	7000	400
				4580	1549	CIV	16000:	8000:	100:
				5640	1909	CIII]	11000:	5500:	70:
1011+465	16.5	-25.2	0.324	3710	2798	MgII	10000	5000	60
				5745	4340	H_γ	-	-	-
				6425	4861	H_β	3000	1500	50
1014+565	17	-28.1	1.234	3460	1549	CIV	-	-	-
				4265	1909	CIII]	10000:	5000	40
				6255	2798	MgII	7600:	3800	70
1018+517	17	-29.7	2.135	3815	1216	L_α+NV	20000	11000	160
				4855	1549	CIV	8900	4400	50
				5975	1909	CIII]	-	-	-
1020+553 B	17	-28.2	1.280:	3535	1549	CIV	-	-	-
				4350	1909	CIII]	-	-	-
				6380	2798	MgII	-	-	-
1024+562	17	-25.8	0.505:	4210	2798	MgII	-	-	-
1031+558	17.5	-26.9	0.935:	3700:	1909	CIII]	-	-	-
				5415	2798	MgII	-	-	-
1036+490	16	-26.4	0.429	4000	2798	MgII	6600	3300	20
				6230	4363	H_γ+[OIII]	-	-	-
				6940	4861	H_β	-	-	-
1052+518	17.5	-28.0	1.386	3695	1549	CIV	10000:	5000:	85:
				4555	1909	CIII]	14000:	7000:	75:
1059+599	17.5	-28.8	1.825	3435	1216	L_α+NV	28000:	3900:	250:
				3955	1400	SiIV+[OIV]	8000	4000	30
				4375	1549	CIV	8500	3000	100
				5395	1909	CIII]	7900:	3900:	50:
1102+536	17	-29.1	1.736:	4235	1549	CIV	7600	3800	60
				5225	1909	CIII]	-	-	-
1107+487	16	-31.1	2.964	4070	1026	L_β+OVI	-	-	-
				4820	1216	L_α+NV	30000:	9000:	800:
1108+511	17.5	-25.5	0.565:	4380	2798	MgII	2400:	1200:	15:
1112+515	16.5	-27.0	0.665:	4660	2798	MgII	5700	2800	20
1116+610	18.5	-28.1	2.016	3665	1216	L_α+NV	15000	4000	300
				4675	1549	CIV	12400	6000	120
1133+555	17	-26.1	0.573:	4400	2798	MgII	7000	1800	80
1136+575	18.5	-24.0	0.451:	4060	2798	MgII	7800	3900	45
1152+523	16.5	-23.5	0.155	4470	3869	[NIII]	-	-	-
				4740	4102	H_δ	-	-	-
				5015	4340	H_γ	-	-	-
				5615	4861	H_β	-	-	-
				5730	4959	[OIII]	-	-	-
				5790	5007	[OIII]	-	-	-
1201+524	15.5	-24.8	0.178	4035	3426	[NeV]	-	-	-
				4395	3727	[OII]	-	-	-
				4560	3869	[NeIII]	-	-	-

Table 2. (continued)

1	2	3	4	5	6	7	8	9	10
				4830	4102	H_δ	-	-	-
				5135	4363	H_γ+[OIII]	-	-	-
				5725	4861	H	11200	3700	150
				5840	4959	[OIII]	-	-	-
				5895	5007	[OIII]	-	-	-
1213+549	A	16.5	-23.4	0.150	3940	3426	[NeV]	-	-
				4290	3727	[OII]	2000	1000	6
				4450	3869	[NeIII]	-	-	-
				4470	3889	H_η+HeI	-	-	-
				4560	3968	H_ε+[NeIII]	-	-	-
				4715	4101	H_δ	3200	1300	7
				4995	4340	H_γ	5000	2000	25
1216+505		17	-28.6	1.464	3815	1549	CIV	6000:	3000:	30:
					3880	1575	[NeV]	-	-	-
					4045	1640	HeII	-	-	-
					4705	1909	CIII]	-	-	-
1217+499		17	-30.5	2.698:	4500	1216	L_α	-	-	-
					5725	1549	CIV	-	-	-
1240+545		17	-30.0	2.318	4035	1216	L_α+NV	20000	9000	350
					5140	1549	CIV	5000	2500:	80
1247+527		16	-24.0	0.161	4765	4102	H_δ	-	-	-
					5035	4340	H_γ	4200	2100	30
					5650	4861	H_β	4700	2300	80
					5820	5007	[OIII]	-	-	-
1249+503		17	-30.1	2.378	3480:	1030	L_β+OVI	-	-	-
					4105	1216	L_α	26000	5900	400
					4190	1240	NV		3200:	
					4730	1400	SiIV+[OIV]	-	-	-
					5230	1549	CIV	14400	7200	100
1303+532		17	-27.1	0.861	3550	1909	CIII]	-	-	-
					5210	2798	MgII	-	-	-
1303+583		17	-25.4	0.444:	4040	2798	MgII	4000:	2000:	15:
1307+462		16	-30.7	2.125	3800	1216	L_α	21000	3500	400
					3875	1240	NV		-	
					4840	1549	CIV	13000	6600	60
					5965	1909	CIII]	8900:	4400:	60:
1309+512		17	-31.0	3.150	4275	1030	L_β+OVI	6200:	3700:	40:
					5045	1216	L_α+NV	26300:	-	500:
1312+495		17	-26.3	0.626:	4550	2798	MgII	-	-	-
1315+577		17	-29.8	2.205	3890	1216	L_α	26300	2800	400
					3965	1240	NV		-	
					4190	1306	OI+SiII	-	-	-
					4480:	1400	SiIV+[OIV]	-	-	-
					4970	1549	CIV	9800	4900	80
1323+566		17	-29.3	1.827	3440	1216	L_α+NV	-	-	-
					3955	1400	SiIV+[OIV]	-	-	-

Table 2. (continued)

1	2	3	4	5	6	7	8	9	10
				4375	1549	CIV	9800	4900	100
				5400	1909	CIII]	-	-	-
1326+529	16.5	-28.9	1.341	3625	1549	CIV	8800:	4400:	60:
				4470	1909	CIII]	7200	3600	20
1335+593	17	-27.8	1.093	3995	1909	CIII]	-	-	-
				5860	2798	MgII	-	-	-
1337+542	17	-24.5	0.295	5625	2798	MgII	12000:	6000:	100:
				5310	4102	H_δ	-	-	-
				5625	4340	H_γ	-	-	-
				6305:	4861	H_β	-	-	-
1341+576	17.5	-30.3	3.000	4160:	1030	L_β+OVI	-	-	-
				4900	1216	L_α	21800	4900	450
				4990	1240	NV		-	
1342+560	16	-28.4	0.941	3710	1909	CIII]	5800:	2900:	30:
				4795:	2470	[OII]	-	-	-
				5425	2798	MgII	6000	2500	30
1349+575	17	-30.7	2.897	4020	1030	L_β+OVI	6600	4000	40
				4740	1216	L_α	25000:	2800:	400:
				4830	1240	NV		-	
				5450	1400	SiIV+[OIV]	-	-	-
				6035	1549	CIV	9700:	4800:	100:
1351+549	18	-25.0	0.558:	4360	2798	MgII	4300	2500	30
1353+564 A	17	-27.6	1.016	3850	1909	CIII]	5600	2800	40
				5635	2798	MgII	3800	2900	45
1357+562	18	-28.3	1.533	3820	1549	CIV	9500	2700	130
				4840	1909	CIII]	11000	5500	90
1359+558	16.5	-27.6	0.835	3505	1909	CIII]	6000:	3000:	40:
				5135	2798	MgII	3000	1500	25
1400+564	17.5	-25.3	0.519:	4250	2798	MgII	5000	2500	60
1406+492	17	-29.8	2.148	3830	1216	L_α+NV	22000	9000	500
				4405	1400	SiIV+[OIV]	-	-	-
				4875	1549	CIV	11000:	5500:	120:
1407+559	18.5	-27.4	1.640	4090	1549	CIV	13200:	6600:	60:
				5040	1909	CIII]	8600:	4300:	50:
1408+544	17.5	-29.5	2.345	4070	1216	L_α	17000	3300	300
				4145	1240	NV		2600:	
				5180	1549	CIV	10400	5200	100
1413+538 A	17.5	-27.6	1.223	3440	1549	CIV	6200:	3100:	75:
				4245	1909	CIII]	7600	3800	45
				6225	2798	MgII	-	-	-
1417+596	18	-29.0	2.311	4025	1216	L_α+NV	26000	1200	500
				4635	1400	SiIV+[OIV]	11400	5700	50
				5130	1549	CIV	18500	9300	120
1419+538	17	-29.3	1.862	3480	1216	L_α	>16000	3100	300:
				3550	1240	NV		-	
				4005	1400	SiIV+[OIV]	5400	2700	40
				4435	1549	CIV	7300	3600	65
				5460	1909	CIII]	8000:	4000:	55:

Table 2. (continued)

1	2	3	4	5	6	7	8	9	10
1421+511	17	-24.3	0.276	3570	2798	MgII	18000:	5900:	150:
				4755	3727	[OII]	-	-	-
				4935	3869	[NeIII]	-	-	-
				5065	3968	[NeIII]	-	-	-
				5575:	4363	H_γ+[OIII]	-	-	-
				6205	4861	H_β	-	-	-
				6335	4959	[OIII]	-	-	-
				6390	5007	[OIII]	-	-	-
1424+502	17.5	-24.8	0.414:	3955	2798	MgII	-	-	-
1426+506	16.5	-28.1	1.016	3845	1909	CIII	9800	4900	35
				5645	2798	MgII	5000:	2400:	40:
1437+509	17	-29.5	1.993	3640	1216	L_α }	20000:	4300:	
				3710	1240	NV }		-	300:
				4190	1400	SiIV+[OIV]	5000:	2500:	30:
				4635	1549	CIV	11400	5700	130
				5710	1909	CIII]	-	-	-
1439+522	16.5	-25.1	0.318	3685	2798	MgII	7200:	3600:	30:
				4910	3727	[OII]	-	-	-
				5405	4102	H_δ	-	-	-
				5720	4340	H_γ	5600	2800	50
				6410	4861	H_β	5000:	2500:	100:
				6605	5007	[OIII]	-	-	-
1458+534	17.5	-24.3	0.341	3745	2798	MgII	5700	2100	45
				5820	4340	H_γ	3600:	1800:	30:
				6525	4861	H_β	4000:	2000:	90
				6720	5007	[OIII]	-	-	-
1500+557	17	-28.0	1.161	3590:	1663	OIII]	-	-	-
				4125	1909	CIII]	10200	5100	30
				6055	2798	MgII	9500	4800	70
1501+506	16.5	-26.4	0.537:	4300	2798	MgII	-	-	-
1503+570	17	-24.9	0.360	3800	2798	MgII	8400	4200	20
				5895	4340	H_γ	7200	3600	50
1504+543	17	-29.4	1.912	3540	1216	L_α }	19600:	4200:	300:
				2610	1240	NV }		3700:	100:
				4075	1400	SiIV+[OIV]	5200	2600	25
				4510	1549	CIV	7200	3600	140
				5560	1909	CIII]	9600:	4800:	100:
1508+585	17	-29.2	1.770	3880	1400	SiIV+[OIV]	-	-	-
				4290	1549	CIV	12400:	6200:	70:
				5290	1909	CIII]	-	-	-
1509+522	17	-23.7	0.210	4960	4102	H_δ	-	-	-
				5250	4340	H_γ	-	-	-
				5885	4861	H_β	4500	1800	75
1510+517	17	-28.9	1.637	3695	1400	SiIV+[OIV]	-	-	-
				4085	1549	CIV	-	-	-
				5035	1909	CIII]	-	-	-
1518+497	17.5	-25.1	0.476:	4130	2798	MgII	-	-	-

Table 2. (continued)

1	2	3	4	5	6	7	8	9	10
1521+598	17.5	-23.9	0.289	3600	2798	MgII	9800	4200	30
				5600	4340	H_γ	7200	2700	20
				6260	4861	H_β	8000	3200	60
				6455	5007	[OIII]	-	-	-
1526+540	17	-28.5	1.384	3695	1549	CIV	11400	5700	120
				3905	1640	HeII	-	-	-
				4550	1909	CIII]	7000	3500	30
1527+522	16	-29.1	1.212	3430	1549	CIV	-	-	-
				3630	1640	HeII	-	-	-
				4220	1909	CIII]	-	-	-
				6190	2798	MgII	-	-	-
1527+530	17	-26.4	0.637:	4580	2798	MgII	14000	7000	100
1532+588	18.5	-25.1	0.690:	4730	2798	MgII	4600:	2300:	30:
1534+528	17	-26.0	0.563	4375	2798	MgII	12000	6000	45
				5350	3426	[NeV]	-	-	-
1543+593	17	-27.0	0.810:	5065	2798	MgII	6400	3200	20
1551+572	18	-24.0	0.370	3830	2798	MgII	5600	2800	15
				5950	4340	H_γ	5400:	2700:	30:
				6665	4861	H_β	-	-	-
1555+553	17	-25.1	0.389	3885	2798	MgII	5400	2700	20
				6040	4340	H_γ	-	-	-
				6760	4861	H_β	-	-	-
1624+566	17.5	-23.3	0.307	3655	2798	MgII.	10200:	5100:	50:
				3885:	2973	[NeV]	-	-	-
				6360	4861	H_β	-	-	-

SHORT REMARKS ON SOME OBJECTS OF TABLE 1 AND 2

0806+505 - Very narrow CIII] (λ_0 1909).

0817+573 - At λ_{obs} 4190 and λ_{obs} 4715 the lines HeII (λ_0 1640) and AlIII (λ_0 1858) are suspected.

0818+506 - At λ_{obs} 3590 the absorption detail is present.

0921+587 - Possible alternative identification z_{em}=1.498.

0929+521 - L_α emission line consists of two narrow and wide components.

0949+527 - Absorption detail at λ_{obs} 4285 is present.

1018+517 - Another possible identification is z_{em}=1.5.

1020+553 B - The identification is uncertain.

1024+562 - Variable, possible identification is z_{em}=1.202.

1052+518 - At λ_{obs} 6675 MgII (λ_0 2798) is suspected.

1102+536 - Possible identification is z_{em}=0.514.

1107+487 - The object is given also by Sanduleak and Pesch (1989) where the value of $z_{em}\approx$3.0 was estimated from low-dispersion objective prism spectrum.

1116+610 - In (Markarian et al., 1984) the redshift value is wrong.

1217+499 - The identification is uncertain.

1240+545 - CIII] (λ_0 1909) emission line is suspected at λ_{obs} 6300.

1247+527 - At λ_{obs} 6820 HeI (λ_0 5876) emission line is suspected.

1303+532 - Absorption detail is suspected at λ_{obs} 4370.

1307+462 - L_α emission line consists of two narrow and wide components.

1309+512 - The profiles of L_β + OVI and L_α + NV are strongly blended by absorption details. Numerous absorption lines are observed on the shortwave of L_α. A strong absorption detail with FWHM≈4000 km/s is observed at λ_{obs} 3800. Probably Damp. QSO. The spectrum is underexposed, therefore the line parameters are defined uncertainly.

1342+560 - The spectra are not corrected for the spectral sensitivity.

1349+575 - The profiles of lines L_β + OVI, L_α + NV and CIV are strongly blended by absorption details. Numerous absorption lines are observed from the shortwave of L_α. An attention is drawn by two strong absorption details at λ_{obs} 3745 with FWHM ≈ 5000 km/s and λ_{obs} 4460 with FWHM≈6000 km/s. Probably BAL QSO, otherwise Damp. QSO.

1406+492 - The profiles of CIV are strongly blended by absorption details. CSO 609 (Sanduleak and Pesch, 1989).

1408+544 - CIV line has strong absorption in the middle. Strong absorption details are observed in the high resolution spectrum from the shortwave of L_α.

1417+596 - Absorption details, shifted from the emission lines at velocities of 6000, 6800 and 5800 km/s, respectively, are observed in the blue wing of L_α+NV, SiIV+[OIV] and CIV emission lines. FWHM of absorption line in the blue wing of L_α is ≈ 3300 km/s. Probably BAL QSO. The line profiles are strongly blended by absorption details, therefore the line parameters have been determined uncertainly.

1419+538 - L_α + NV line is on the edge of the spectrum, therefore the lower values of the line parameters are presented.

1421+511 - CSO 643 (Sanduleak and Pesch, 1989).

1424+502 - Possible identification is also z_{em} =1.553.

1426+506 - CSO 654 (Sanduleak and Pesch, 1989).

1437+509 - CSO 677 (Sanduleak and Pesch, 1989).

1439+522 - CSO 680 (Sanduleak and Pesch, 1989).

1500+557 - Possible identification is also z_{em} = 0.475.

1504+543 - CSO 722 (Sanduleak and Pesch, 1989).

1518+497 - The identification z_{em} = 1.6 is also possible.

1526+540 - CSO 758 (Sanduleak and Pesch, 1989).

1527+522 - CSO 759 (Sanduleak and Pesch, 1989).

1532+588 - In the paper (Stepanian et al., 1986) this object has the number 55, where the wrong coordinates are presented.

CONCLUSION

Among 100 investigated quasistellar objects we discovered one candidate for Damp. QSO - SBS 1309+512, and two BAL QSO - SBS 1349+575 and SBS 1417+596. It should be noted that in two remaining objects the absorption features have intermediate FWHM between those of BAL QSOs and QSOs with L_α forest.

So, the data of spectral studies of 216 QSOs from the SBS survey are presented.

Acknowledgements

The authors thank their colleagues A. Knyazev, A. Ugryumov and S. Pustil'nik for help during observations. All observations were fulfiled due to observational time provided by the 6 m Telescope Time Allocation Comission.

REFERENCES

Markarian B.E., Stepanian J.A., Lipovetsky V.A.: 1984, *Astron. Tsirk.*, **1381**, 7.

Sanduleak N., Pesch P.: 1989, *Astrophys. J. Suppl. Ser.*, **70**, 173.

Sanduleak N., Pesch P.: 1989, *P.A.S.P.*, **101**, 1081.

Schmidt M, Green R.F.: 1983, *Astrophys. J.*, **269**, 352.

Stepanian J.A., Lipovetsky V.A., Shapovalova A.I., Erastova L.K.: 1990, *Astrofizika*, **33**, 89.

Stepanian J.A., Lipovetsky V.A., Shapovalova A.I., Erastova L.K., Chavushian V.H.: 1990, *Astrofizika*, **33**, 199.

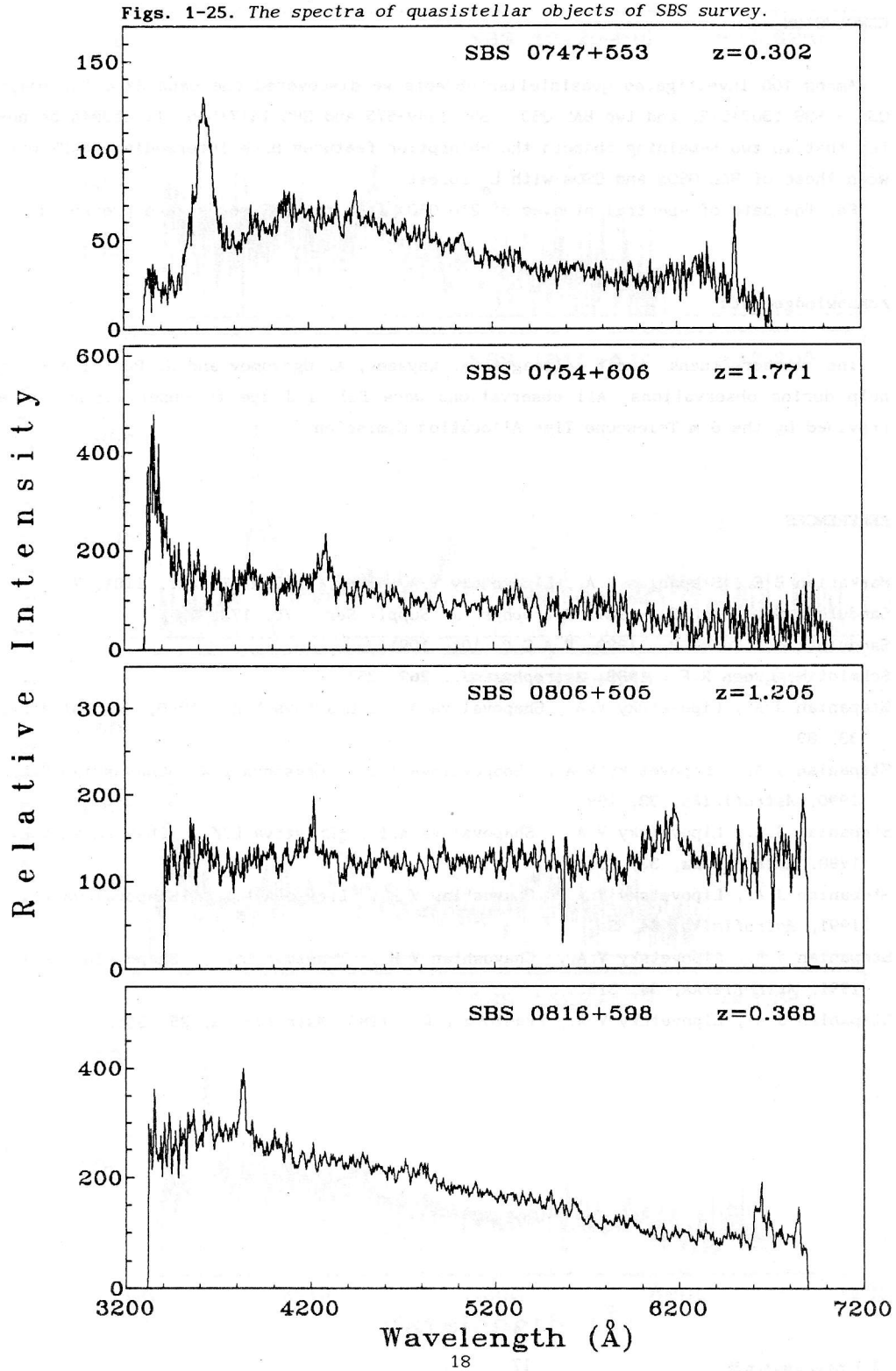
Stepanian J.A., Lipovetsky V.A., Shapovalova A.I., Erastova L.K., Chavushian V.H.: 1990, *Astrofizika*, **33**, 351.

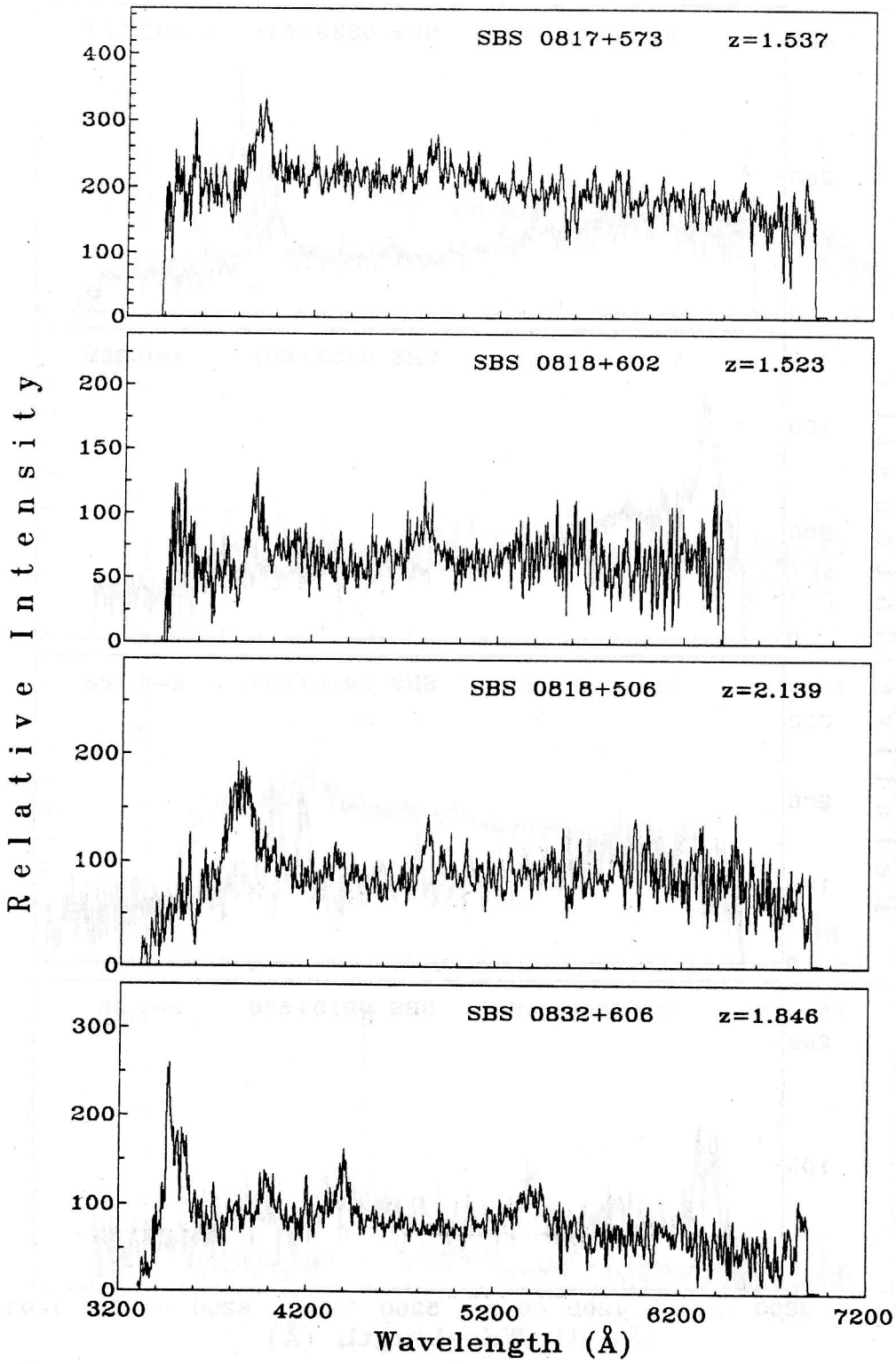
Stepanian J.A., Lipovetsky V.A., Chavushian V.H., Erastova L.K., Shapovalova A.I.: 1991, *Astrofizika*, **34**, 5.

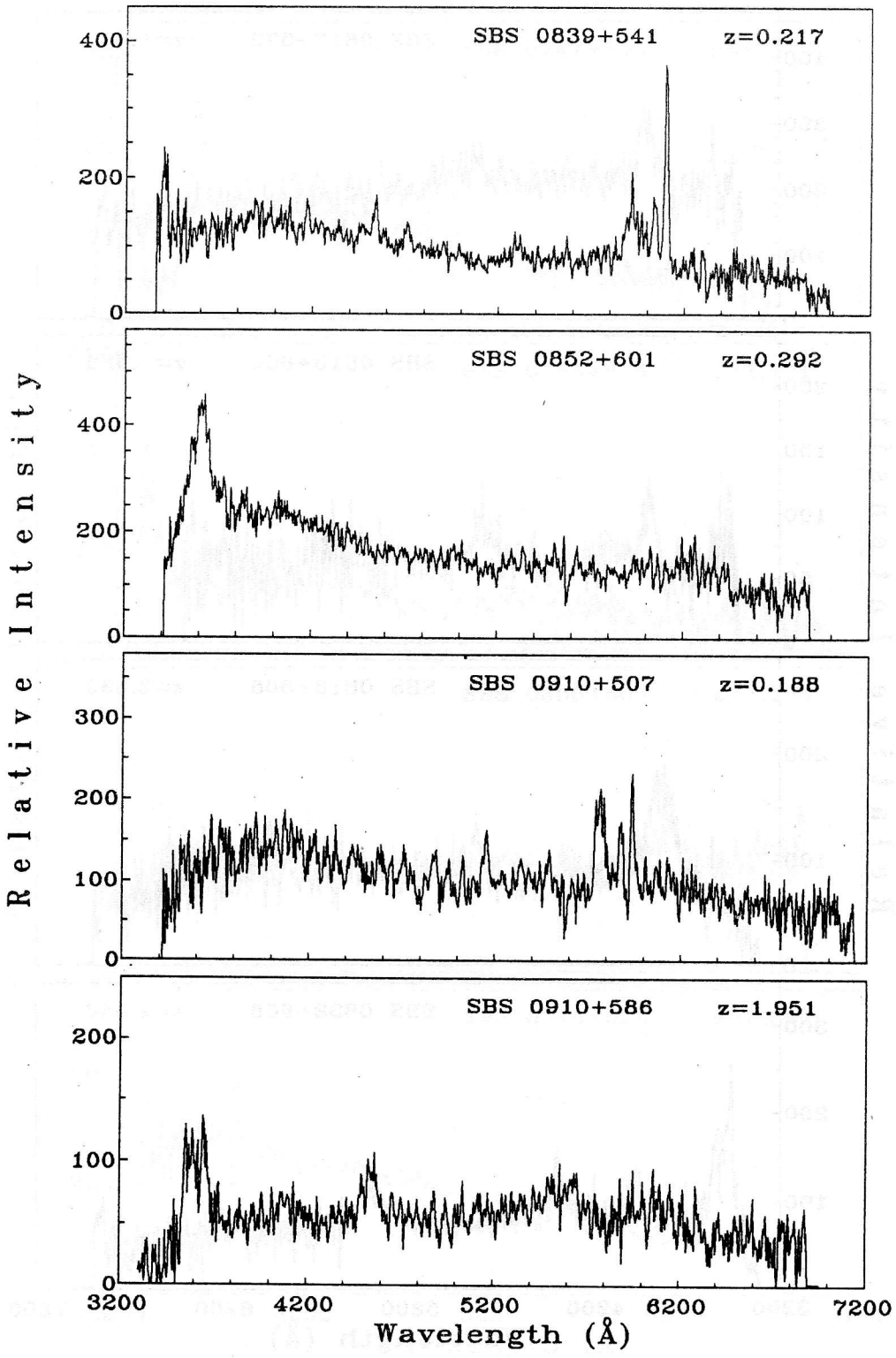
Stepanian J.A., Lipovetsky V.A., Chavushian V.H., Erastova L.K., Shapovalova A.I.: 1991, *Astrofizika*, **34**, 315.

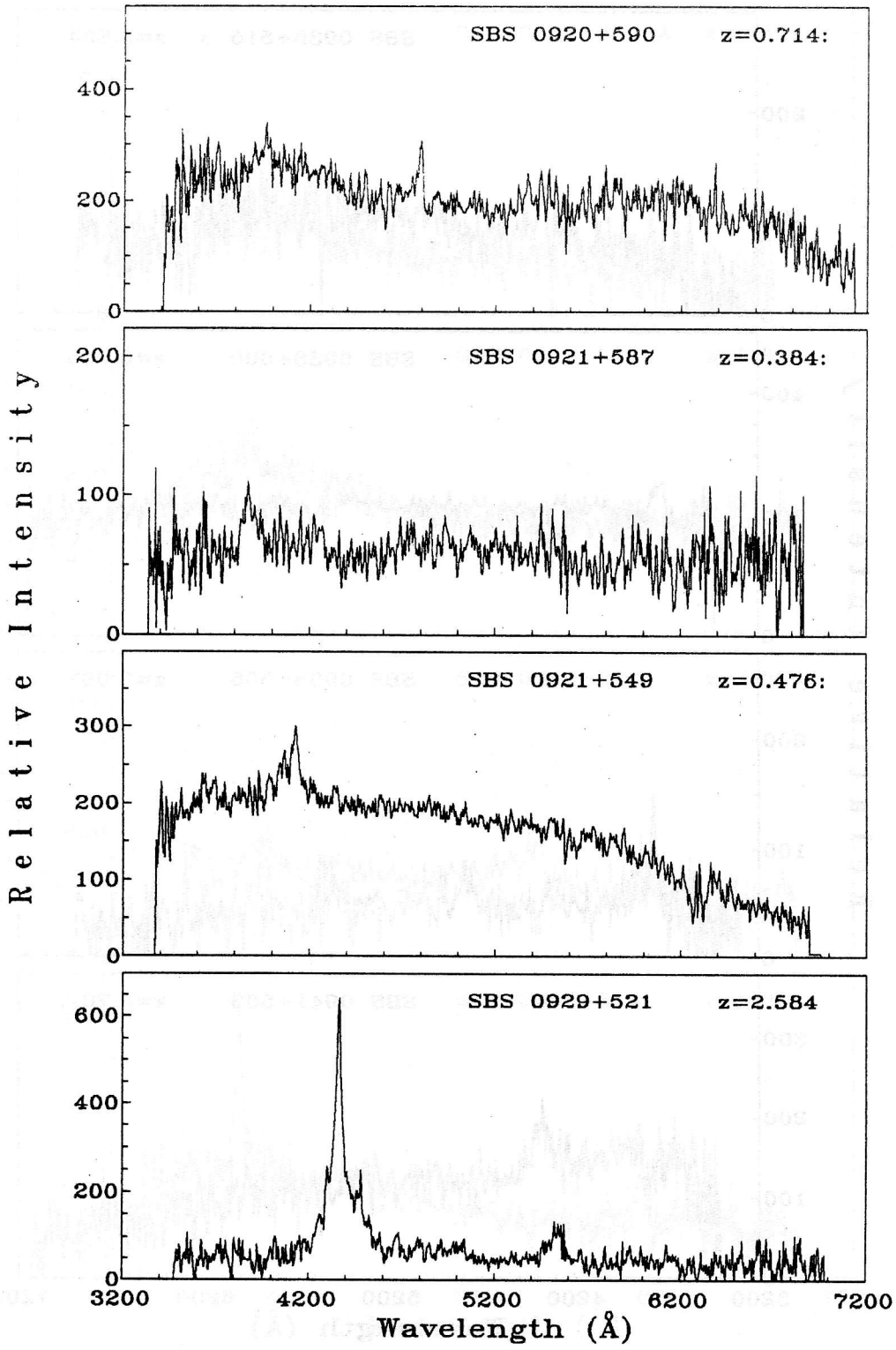
Stepanian J.A., Lipovetsky V.A., Erastova L.K.: 1986, *Astrofizika*, **25**, 345.

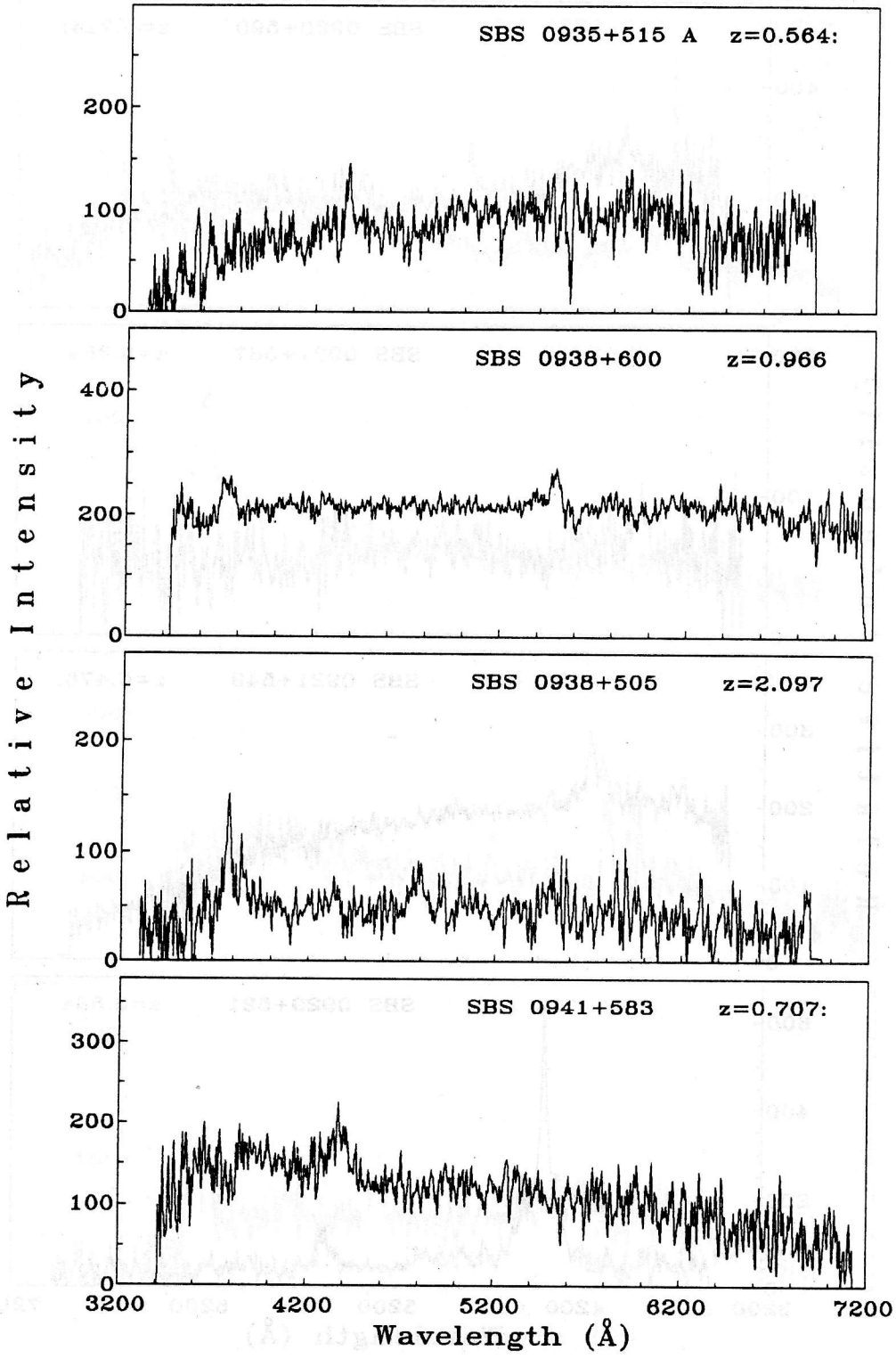
Figs. 1-25. *The spectra of quasistellar objects of SBS survey.*

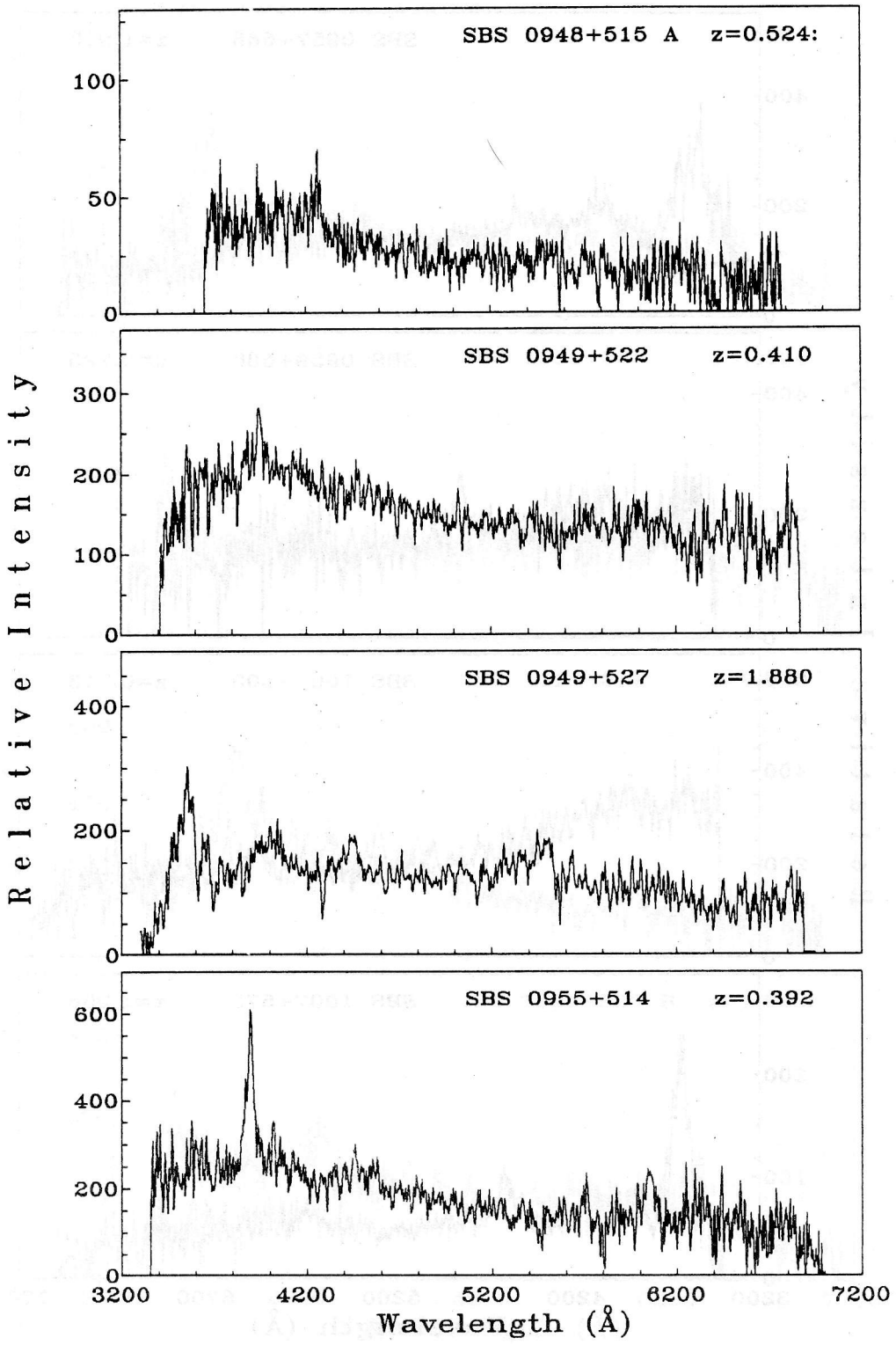


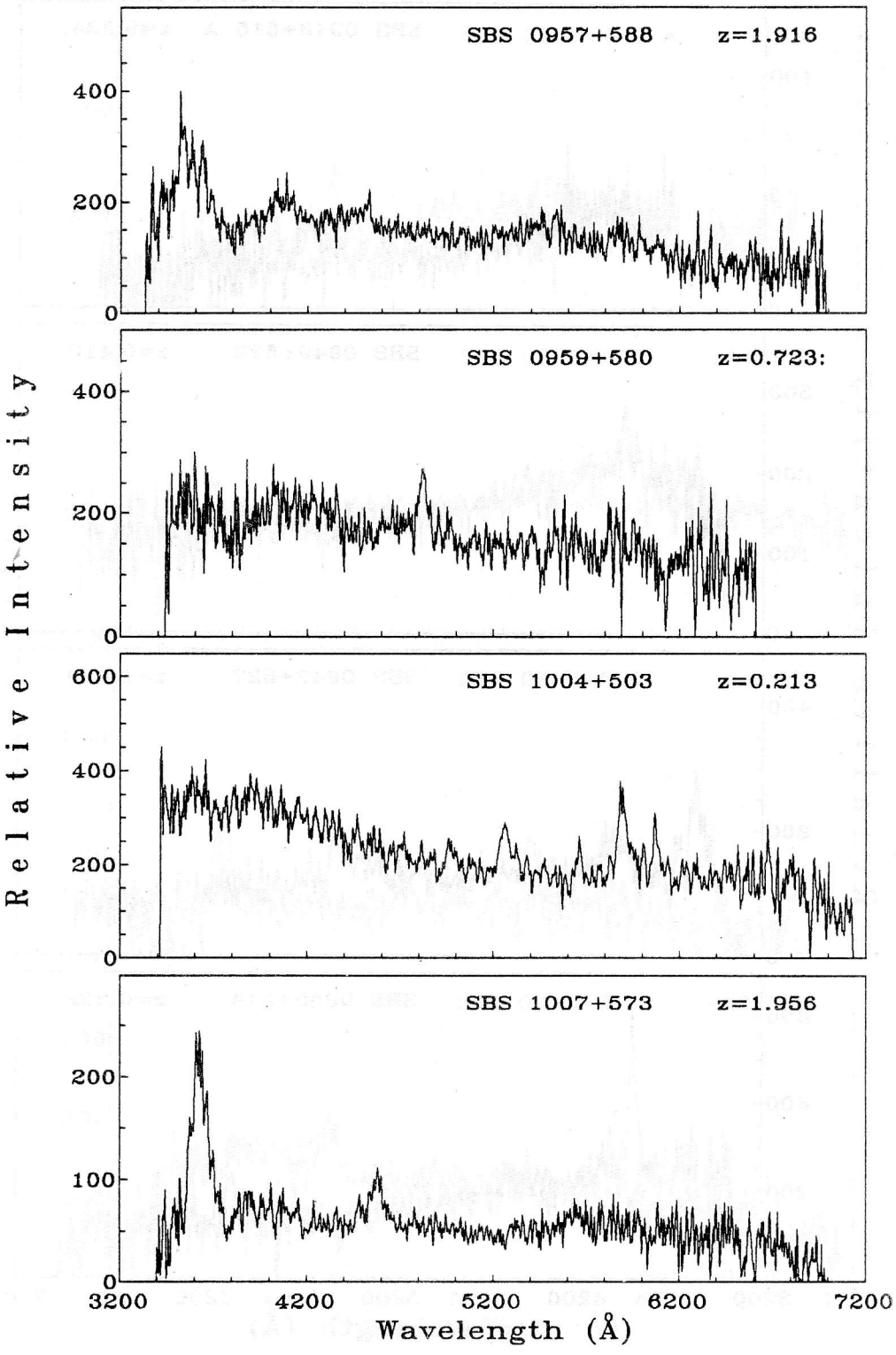

SBS 0817+573 z=1.537
SBS 0818+602 z=1.523
SBS 0818+506 z=2.139
SBS 0832+606 z=1.846
Relative Intensity
Wavelength (Å)
3200
4200
5200
6200
7200

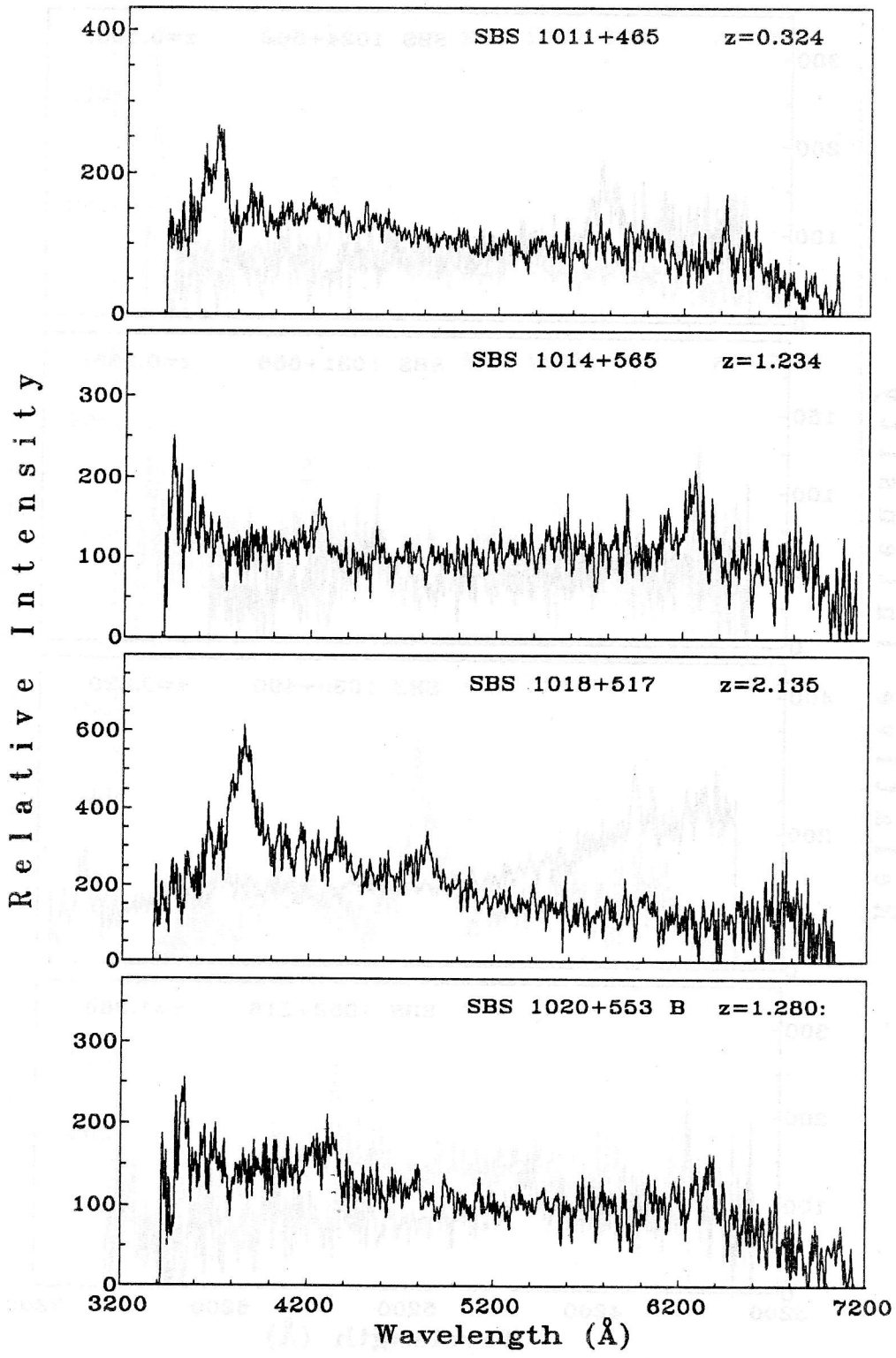

SBS 0839+541 z=0.217
SBS 0852+601 z=0.292
SBS 0910+507 z=0.188
SBS 0910+586 z=1.951
Relative Intensity
Wavelength (Å)
400
200
0
400
200
0
300
200
100
0
200
100
0
3200
4200
5200
6200
7200

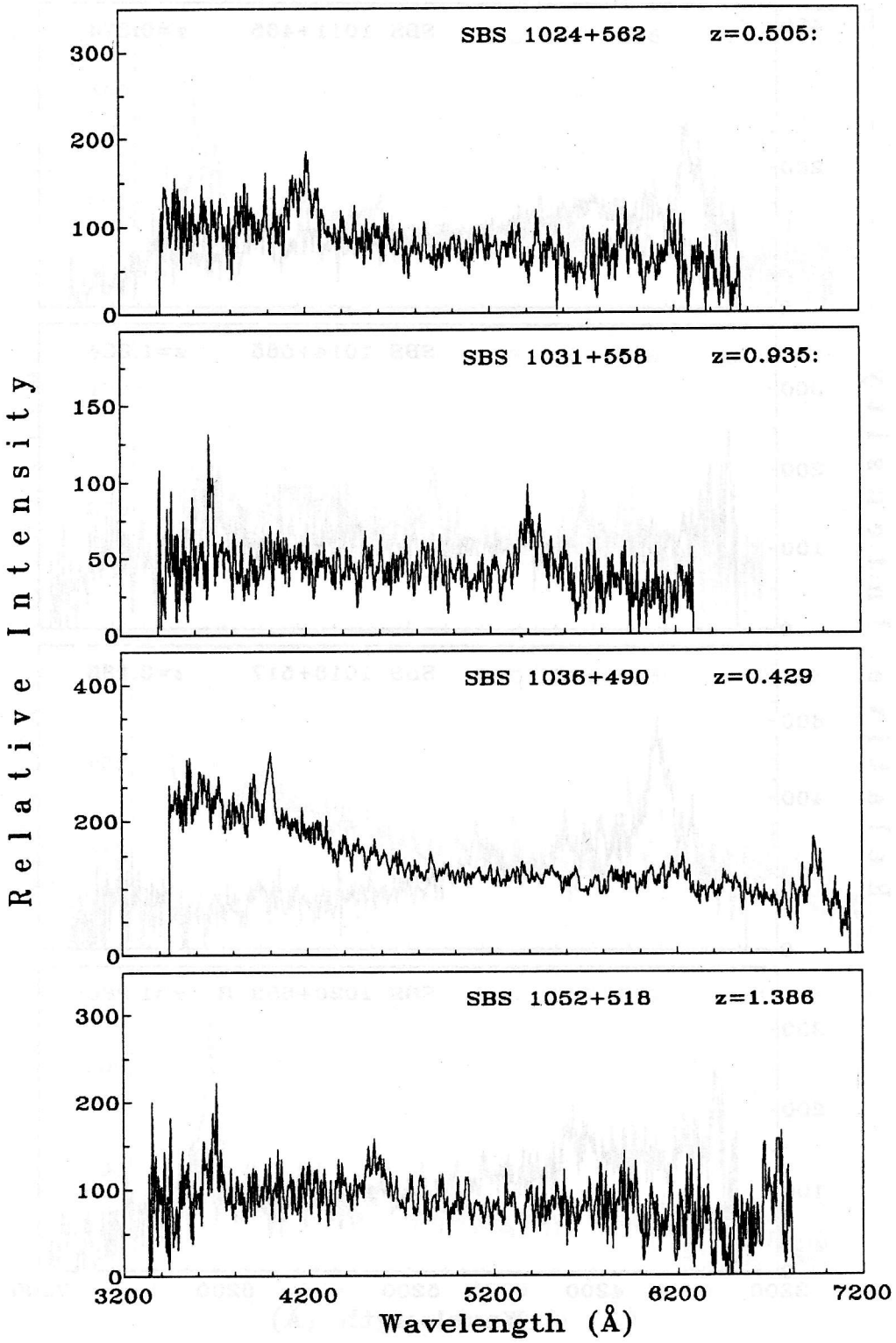

SBS 0920+590 z=0.714:
SBS 0921+587 z=0.384:
SBS 0921+549 z=0.476:
SBS 0929+521 z=2.584
Relative Intensity
Wavelength (Å)
0
100
200
300
400
600
3200
4200
5200
6200
7200

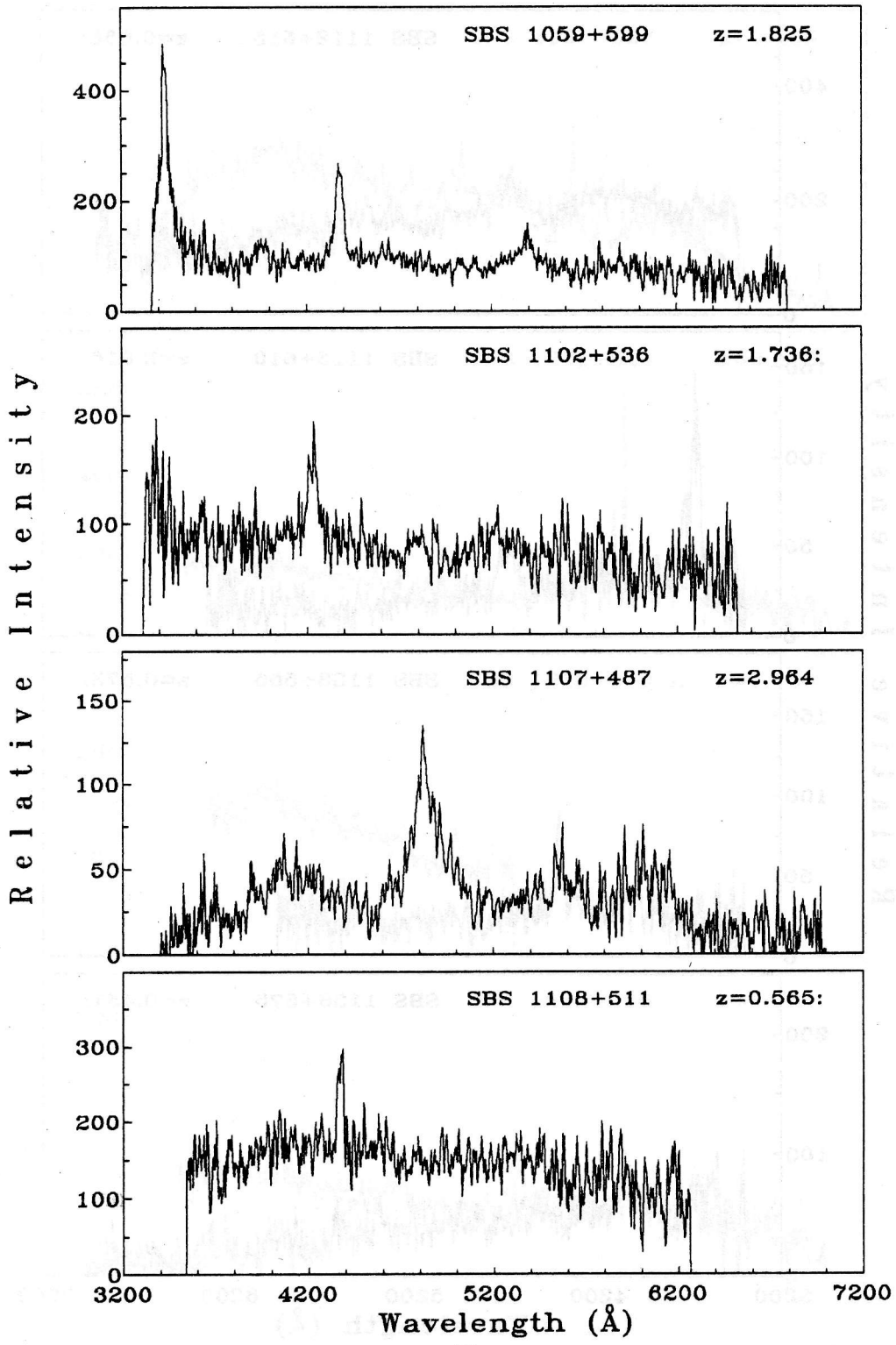

SBS 0935+515 A z=0.564:
SBS 0938+600 z=0.966
SBS 0938+505 z=2.097
SBS 0941+583 z=0.707:
Relative Intensity
Wavelength (Å)
3200
4200
5200
6200
7200

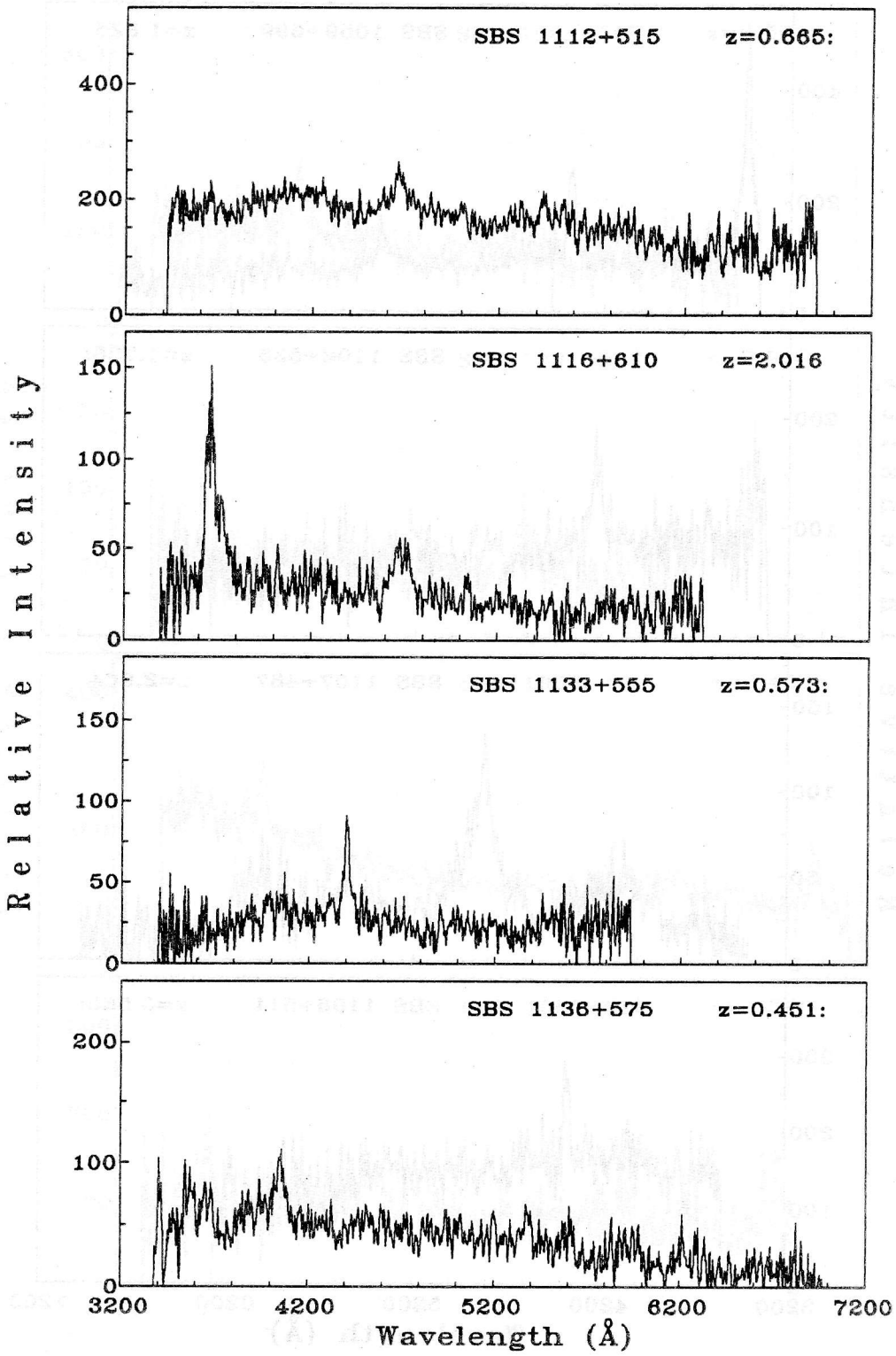

SBS 0948+515 A z=0.524:
SBS 0949+522 z=0.410
SBS 0949+527 z=1.880
SBS 0955+514 z=0.392
Relative Intensity
Wavelength (Å)
0
50
100
200
300
400
600
3200
4200
5200
6200
7200

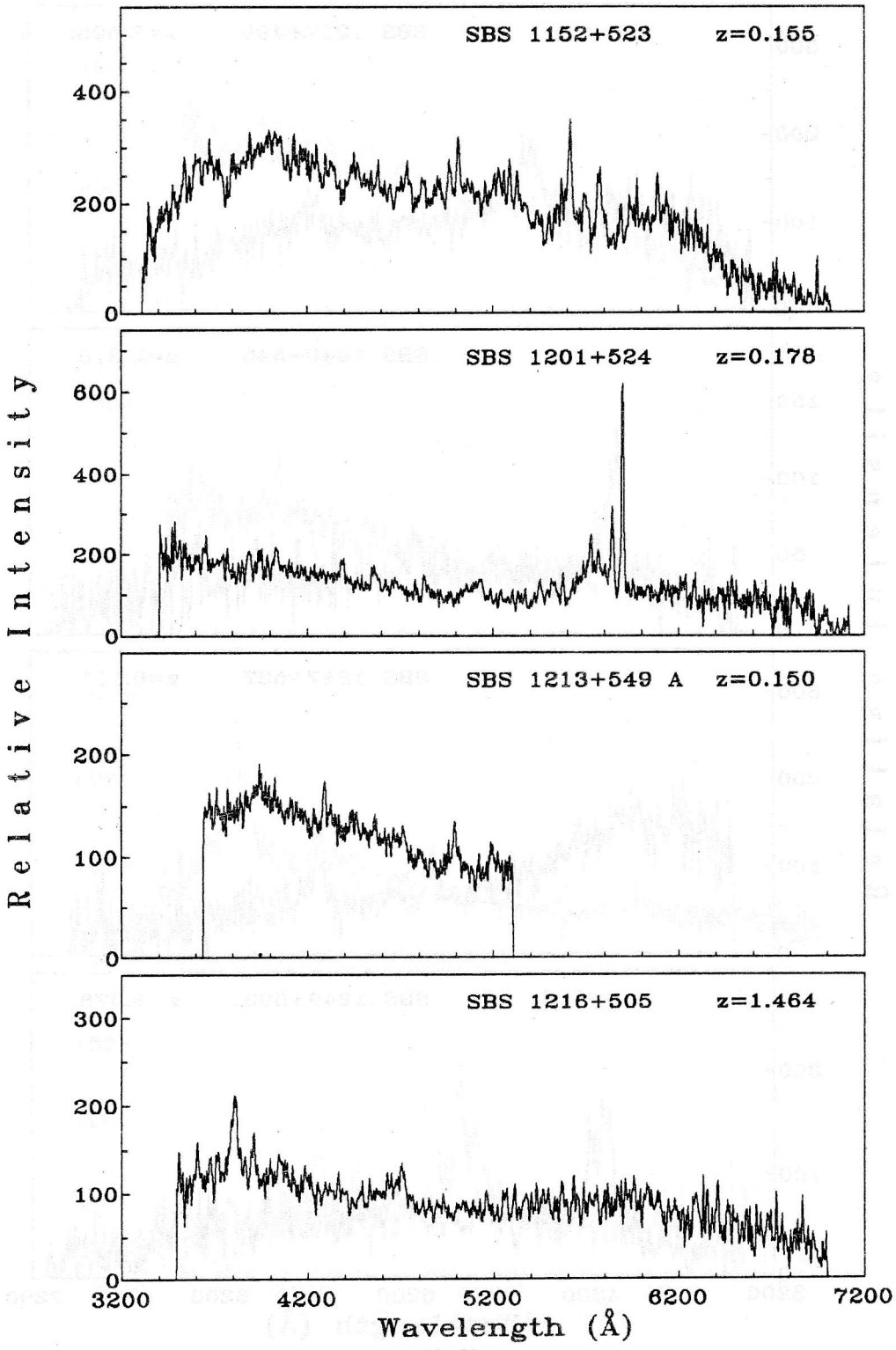

SBS 0957+588 z=1.916
SBS 0959+580 z=0.723:
SBS 1004+503 z=0.213
SBS 1007+573 z=1.956
Relative Intensity
Wavelength (Å)
3200
4200
5200
6200
7200
0
100
200
400
600

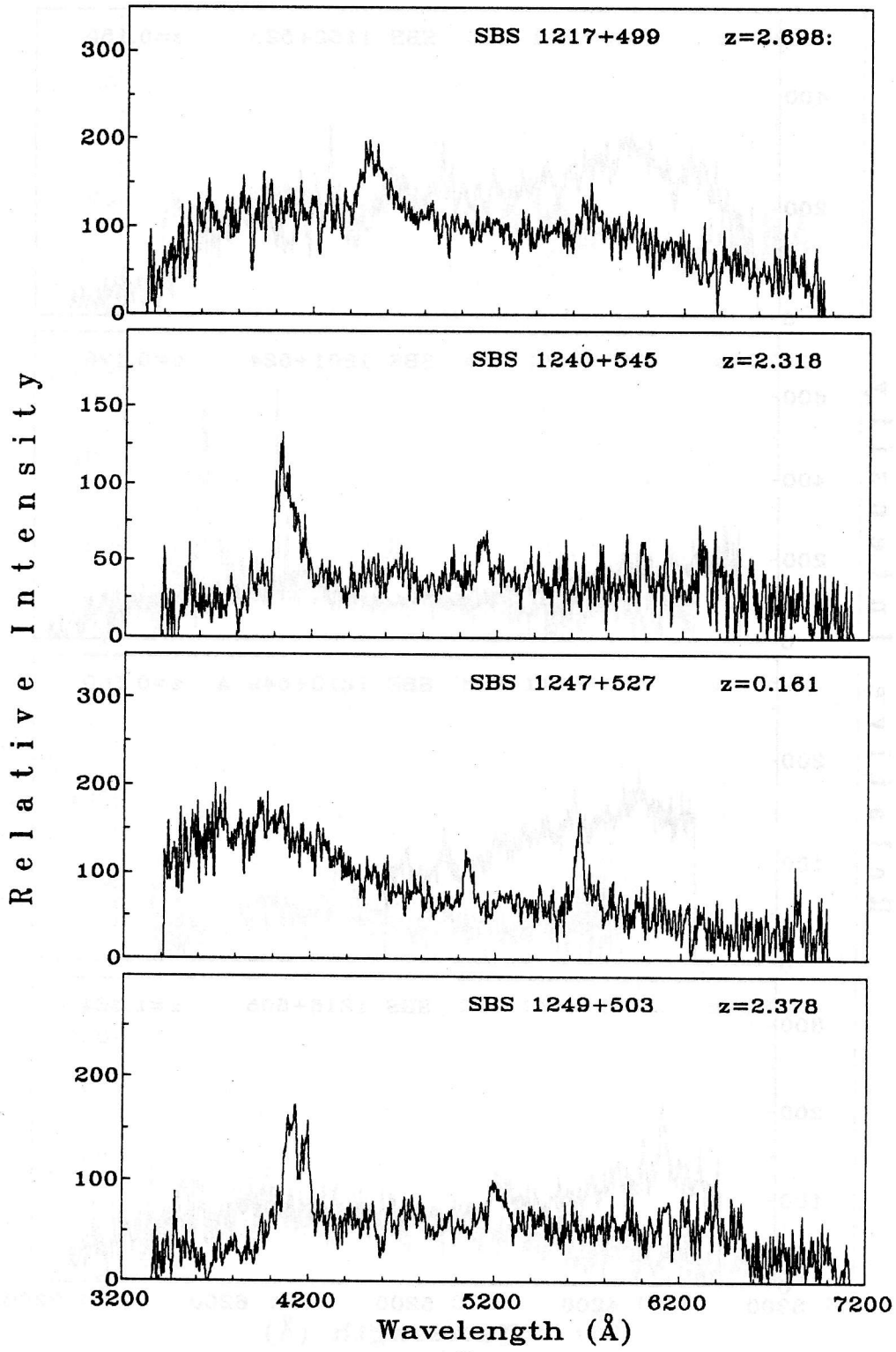

SBS 1011+465 z=0.324
SBS 1014+565 z=1.234
SBS 1018+517 z=2.135
SBS 1020+553 B z=1.280:
Relative Intensity
Wavelength (Å)
0
100
200
300
400
600
3200
4200
5200
6200
7200

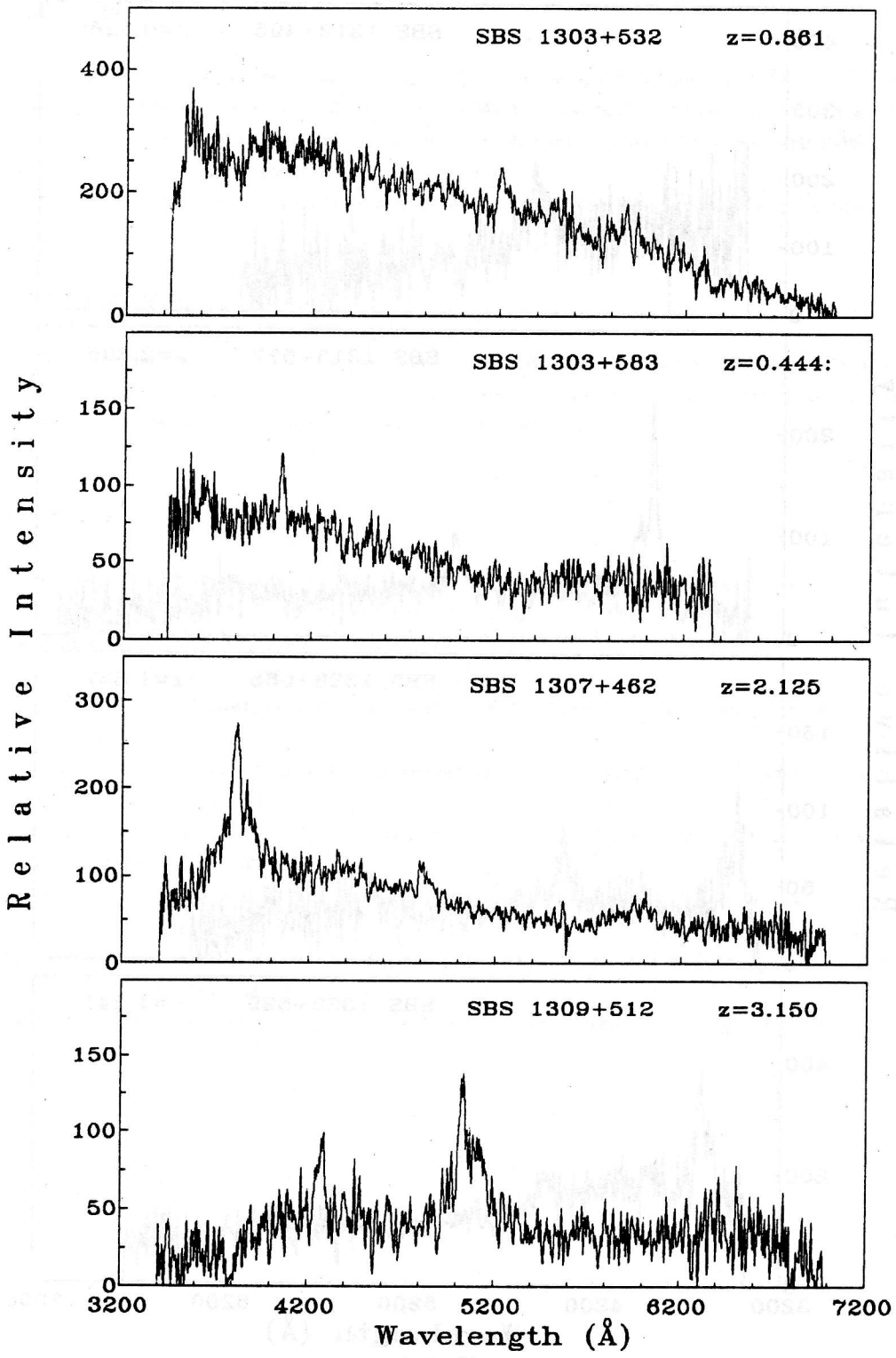

SBS 1024+562 z=0.505:
SBS 1031+558 z=0.935:
SBS 1036+490 z=0.429
SBS 1052+518 z=1.386
Relative Intensity
Wavelength (Å)
3200
4200
5200
6200
7200

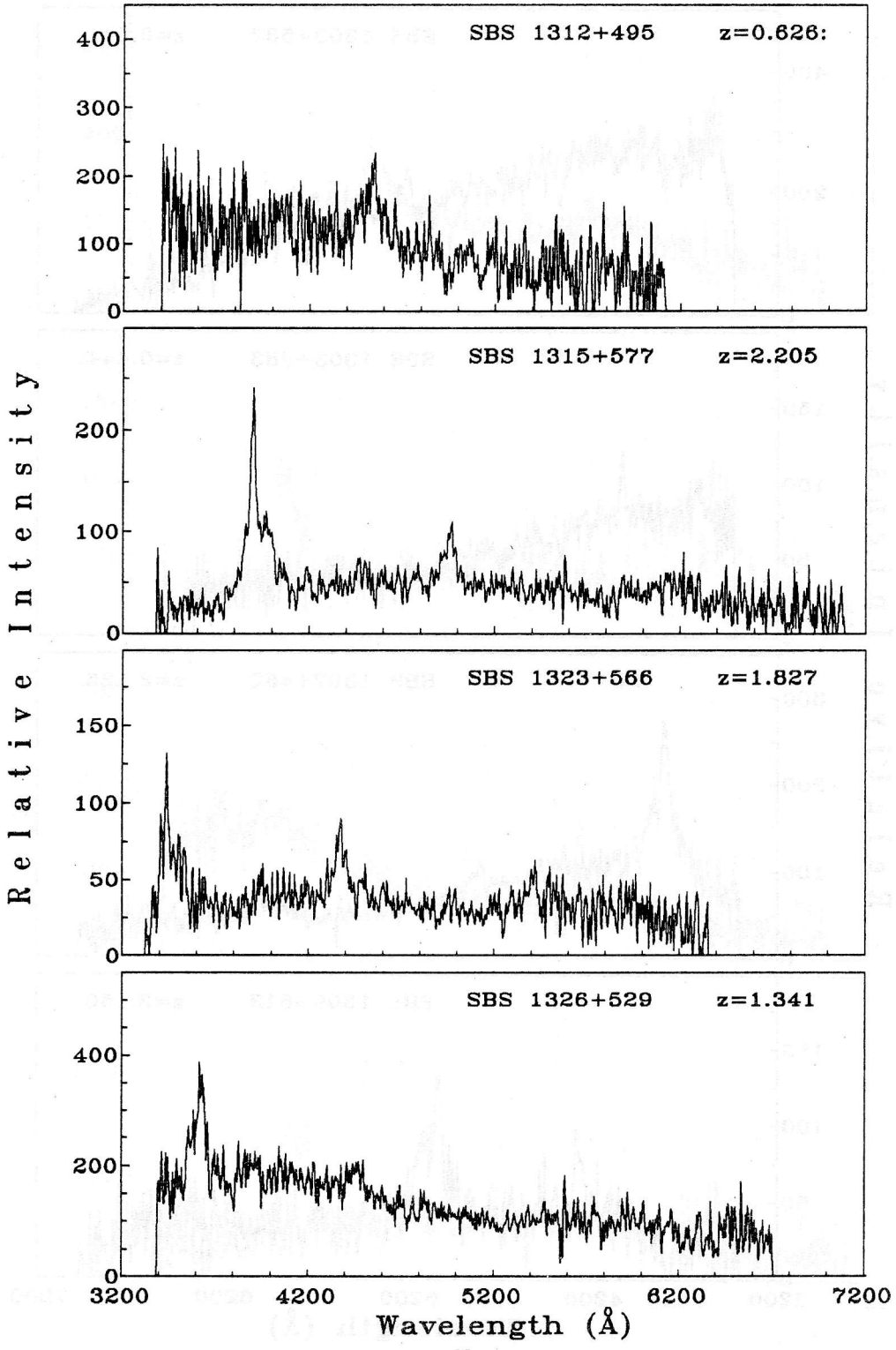

SBS 1059+599 z=1.825
SBS 1102+536 z=1.736:
SBS 1107+487 z=2.964
SBS 1108+511 z=0.565:
Relative Intensity
Wavelength (Å)
3200
4200
5200
6200
7200

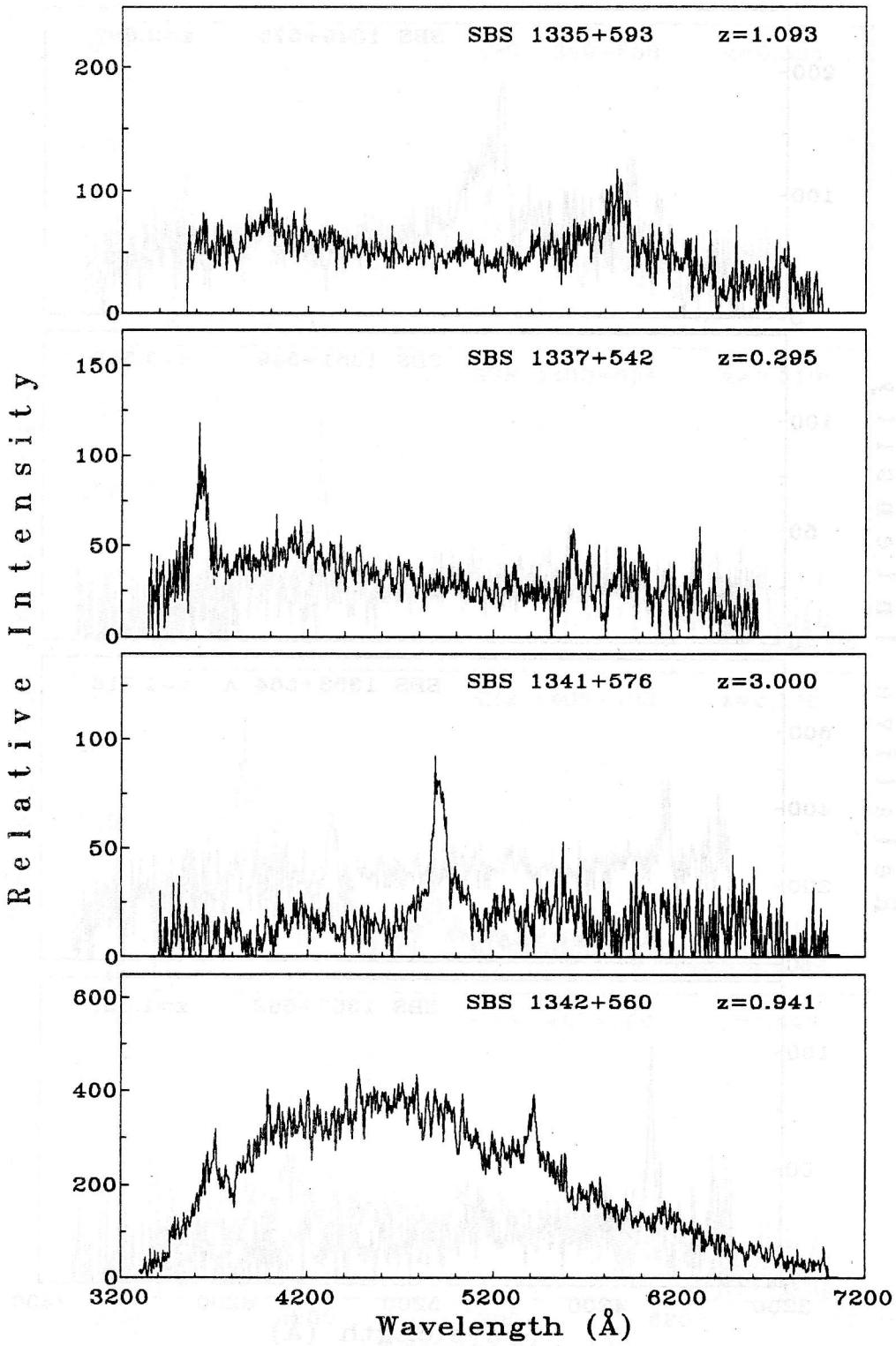

SBS 1112+515 z=0.665:
SBS 1116+610 z=2.016
SBS 1133+555 z=0.573:
SBS 1136+575 z=0.451:
Relative Intensity
Wavelength (Å)
400
200
0
150
100
50
0
150
100
50
0
200
100
0
3200
4200
5200
6200
7200

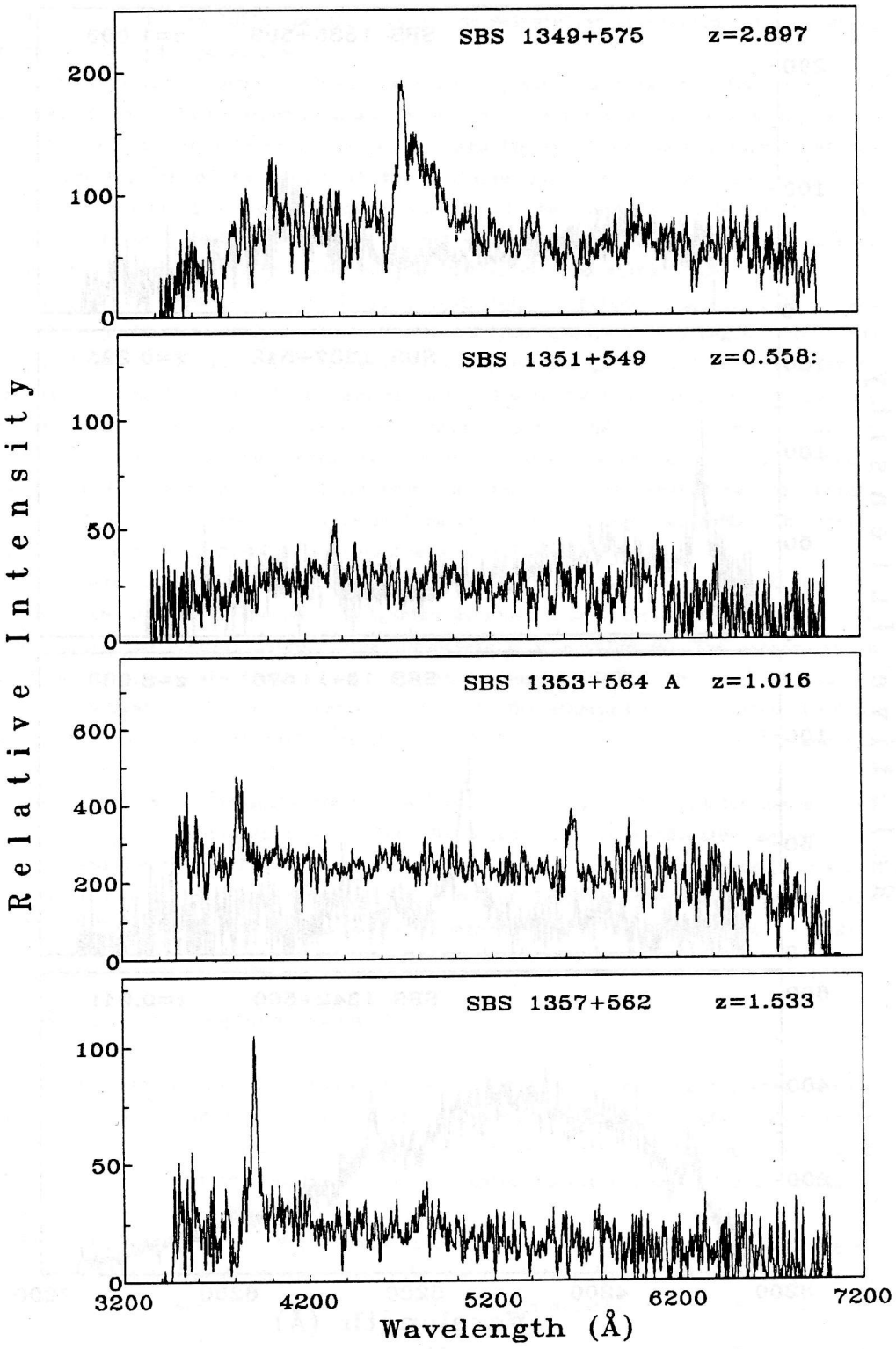

SBS 1152+523 z=0.155
SBS 1201+524 z=0.178
SBS 1213+549 A z=0.150
SBS 1216+505 z=1.464
Relative Intensity
Wavelength (Å)
0
100
200
300
400
600
3200
4200
5200
6200
7200

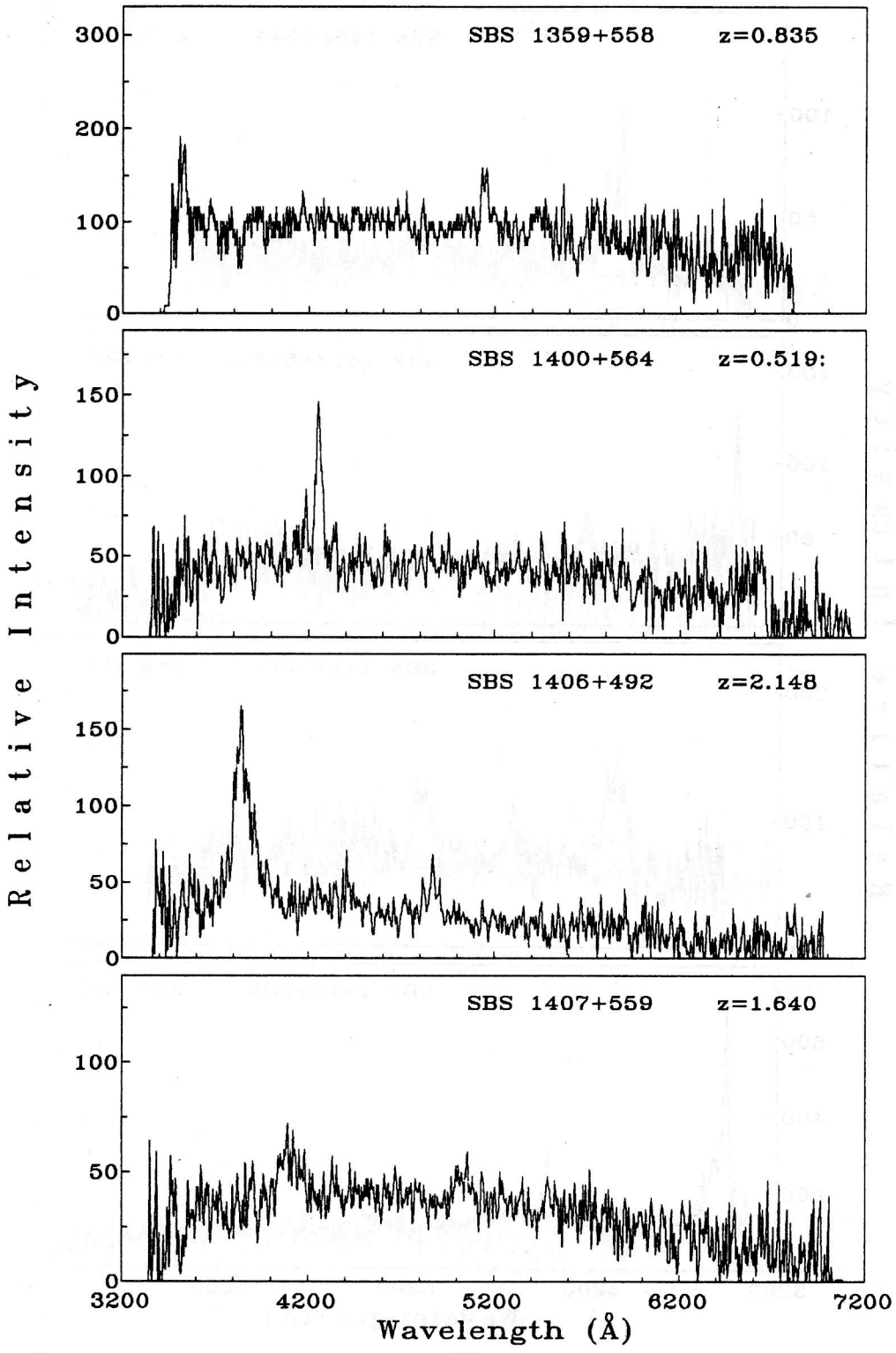

SBS 1217+499 z=2.698:
SBS 1240+545 z=2.318
SBS 1247+527 z=0.161
SBS 1249+503 z=2.378
Relative Intensity
Wavelength (Å)
3200
4200
5200
6200
7200

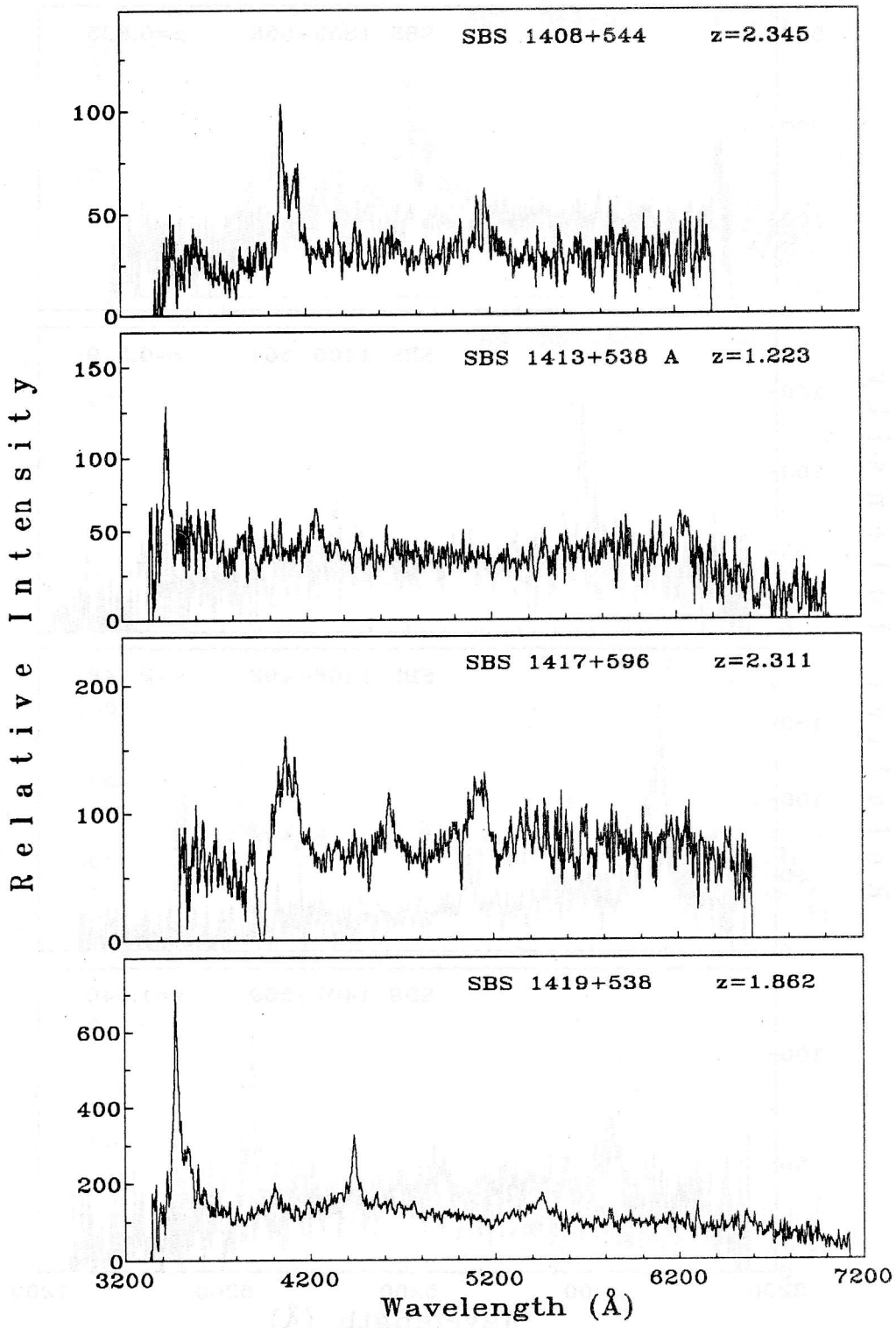

SBS 1303+532 z=0.861
SBS 1303+583 z=0.444:
SBS 1307+462 z=2.125
SBS 1309+512 z=3.150
Relative Intensity
Wavelength (Å)
0
50
100
150
200
300
400
3200
4200
5200
6200
7200

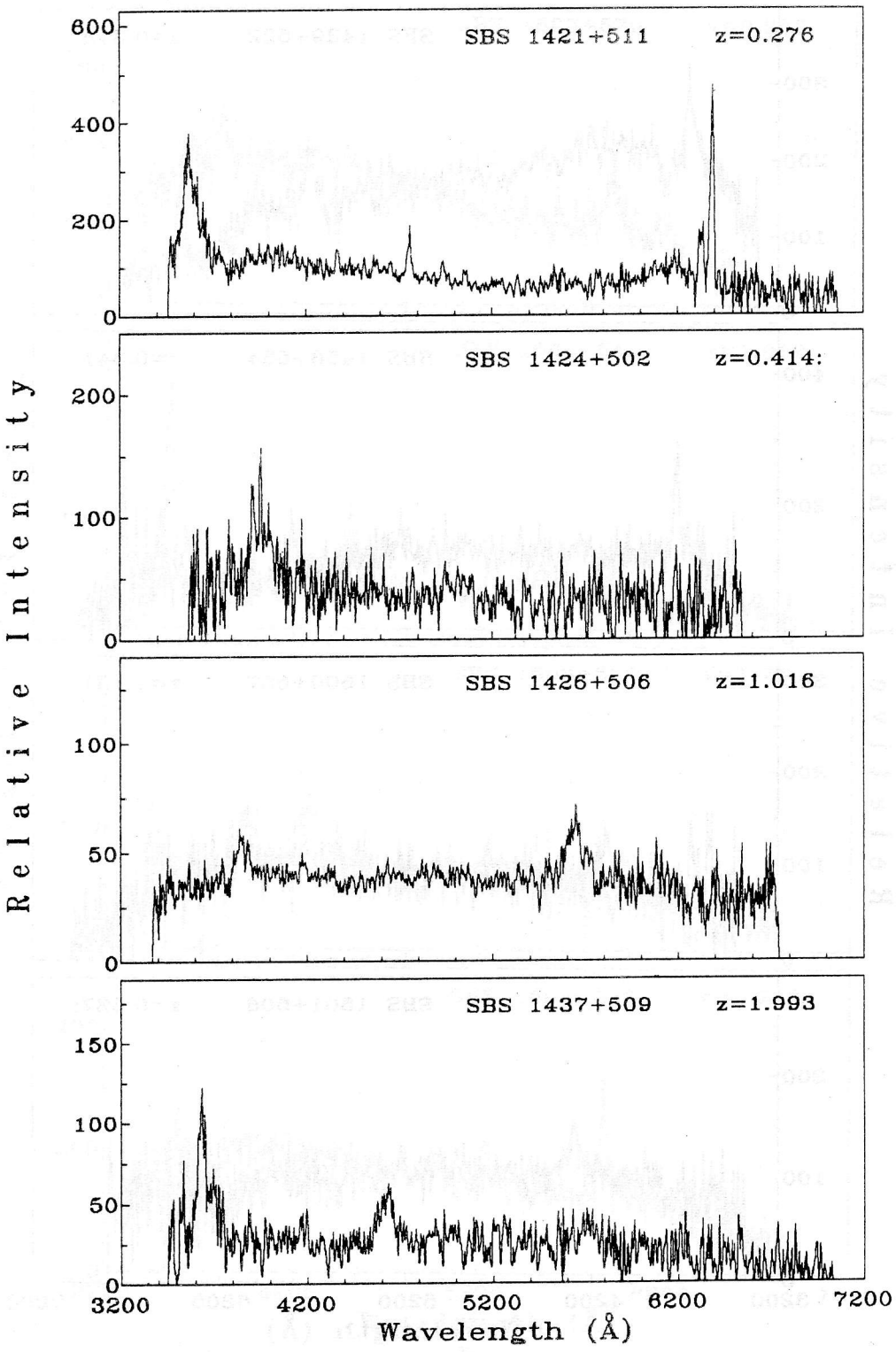

SBS 1312+495 z=0.626:
SBS 1315+577 z=2.205
SBS 1323+566 z=1.827
SBS 1326+529 z=1.341
Relative Intensity
Wavelength (Å)
3200
4200
5200
6200
7200

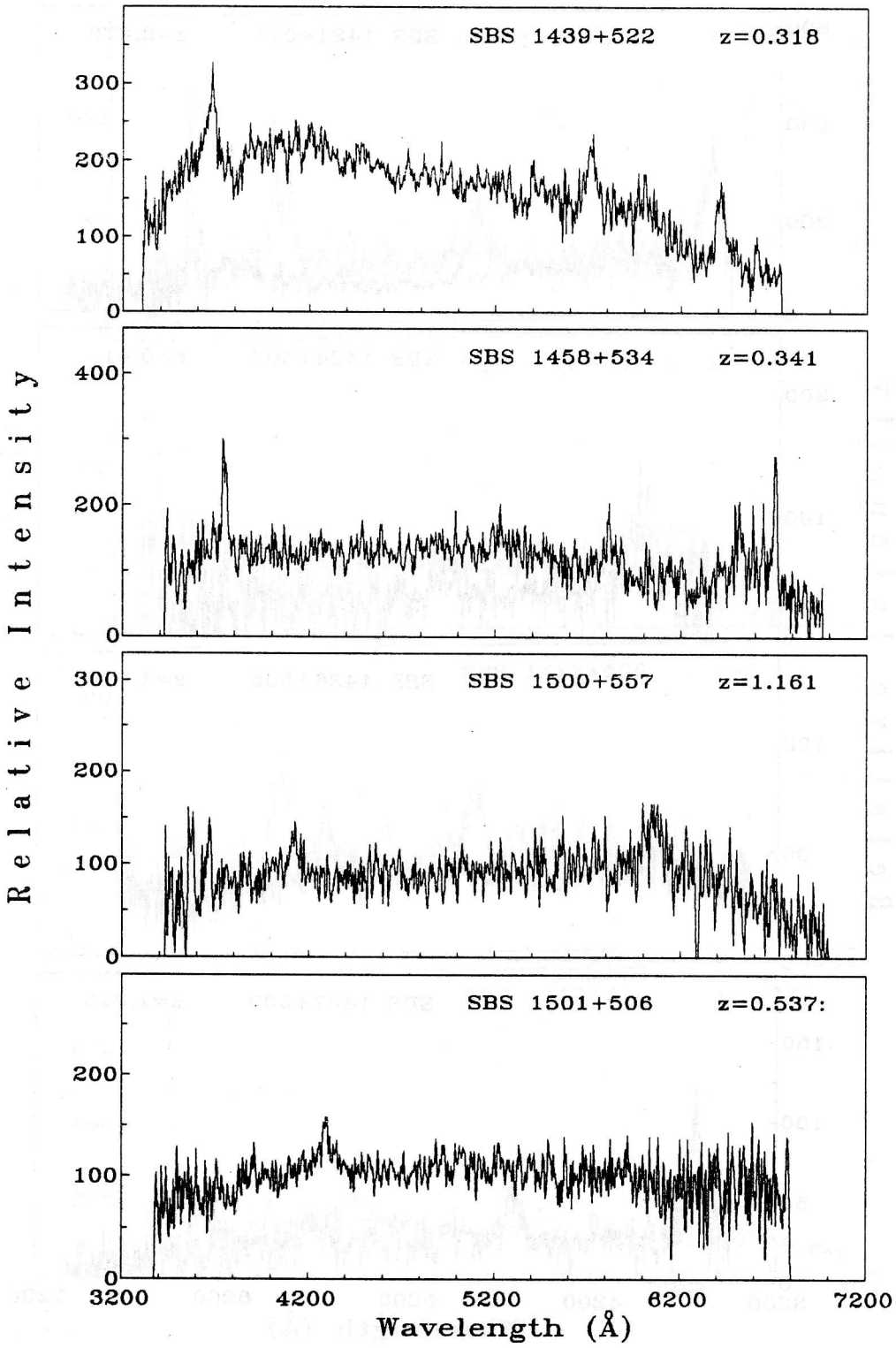

SBS 1335+593 z=1.093
SBS 1337+542 z=0.295
SBS 1341+576 z=3.000
SBS 1342+560 z=0.941
Relative Intensity
Wavelength (Å)
3200
4200
5200
6200
7200

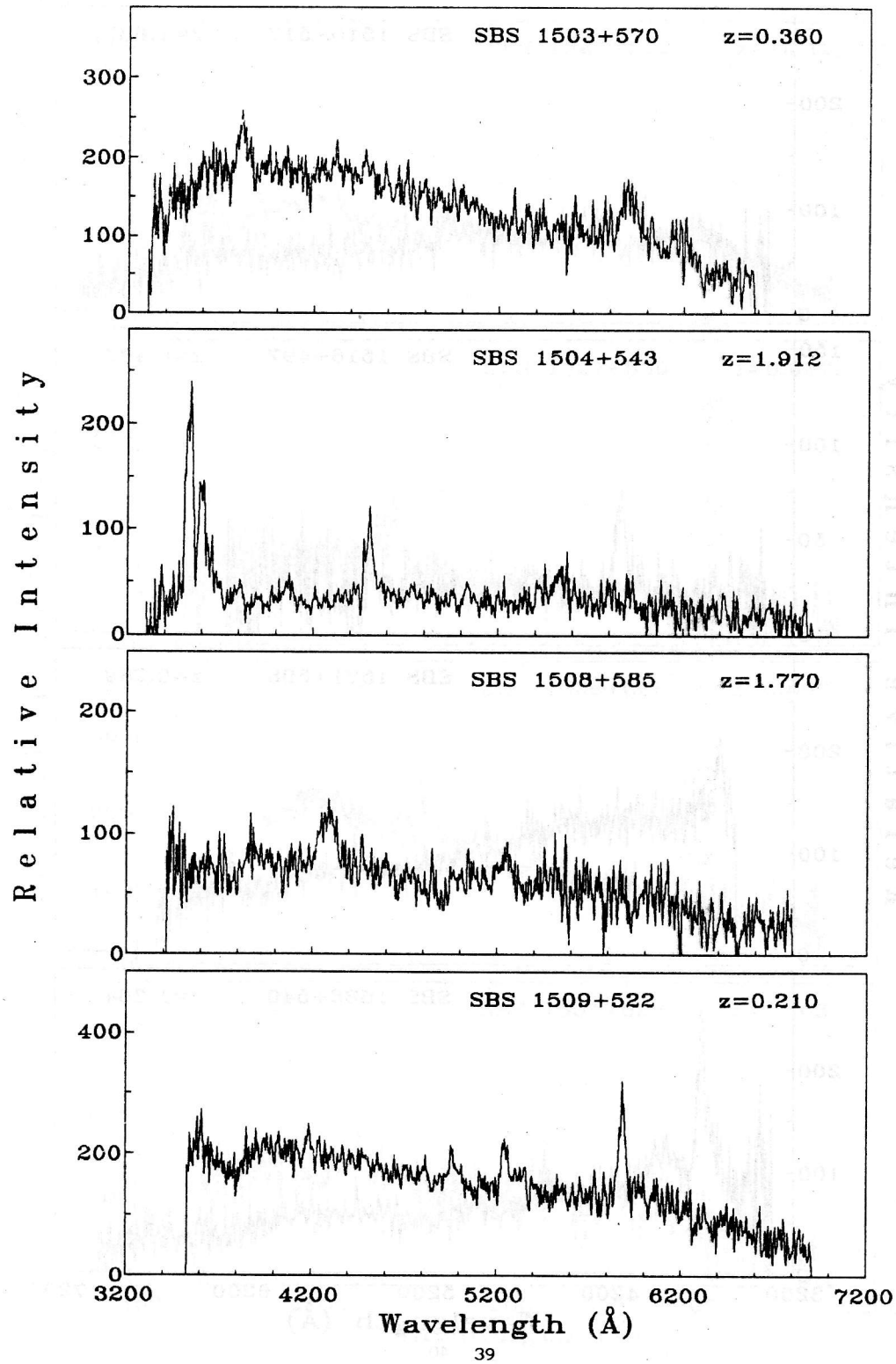

SBS 1349+575 z=2.897
SBS 1351+549 z=0.558:
SBS 1353+564 A z=1.016
SBS 1357+562 z=1.533
Relative Intensity
Wavelength (Å)
3200
4200
5200
6200
7200

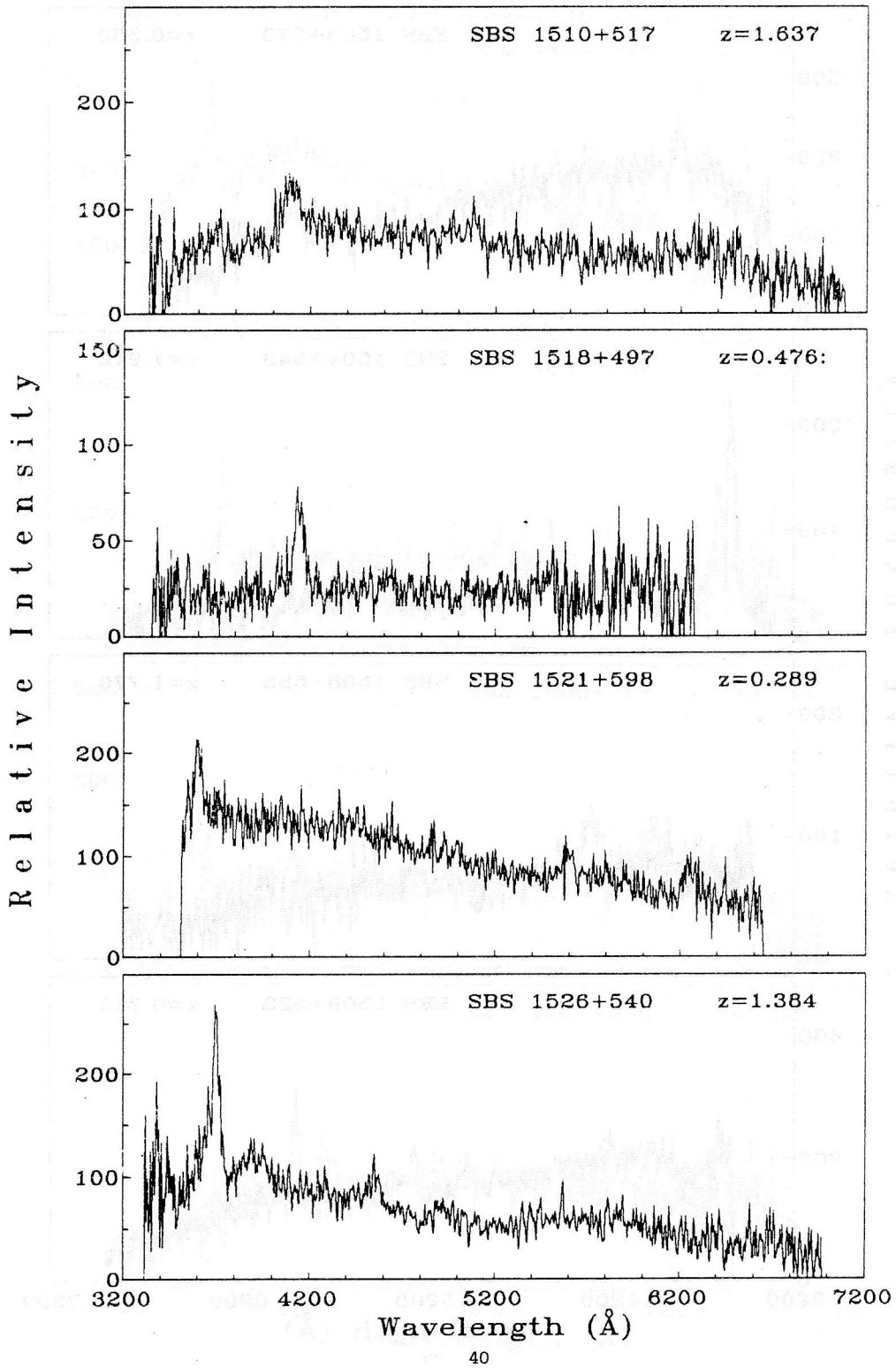

SBS 1359+558 z=0.835
SBS 1400+564 z=0.519:
SBS 1406+492 z=2.148
SBS 1407+559 z=1.640
Relative Intensity
Wavelength (Å)
3200
4200
5200
6200
7200

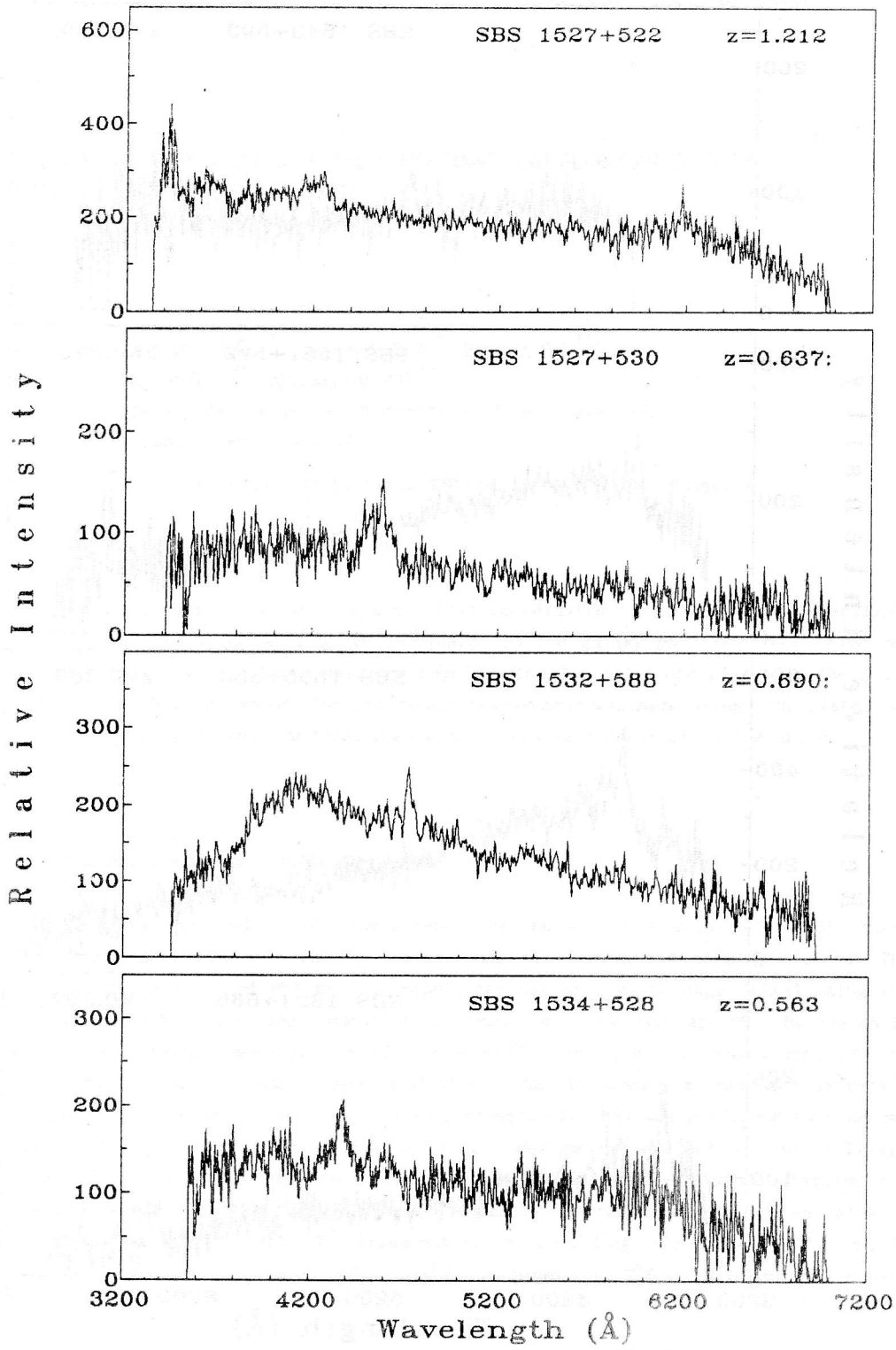

SBS 1408+544 z=2.345
SBS 1413+538 A z=1.223
SBS 1417+596 z=2.311
SBS 1419+538 z=1.862
Relative Intensity
Wavelength (Å)
3200
4200
5200
6200
7200

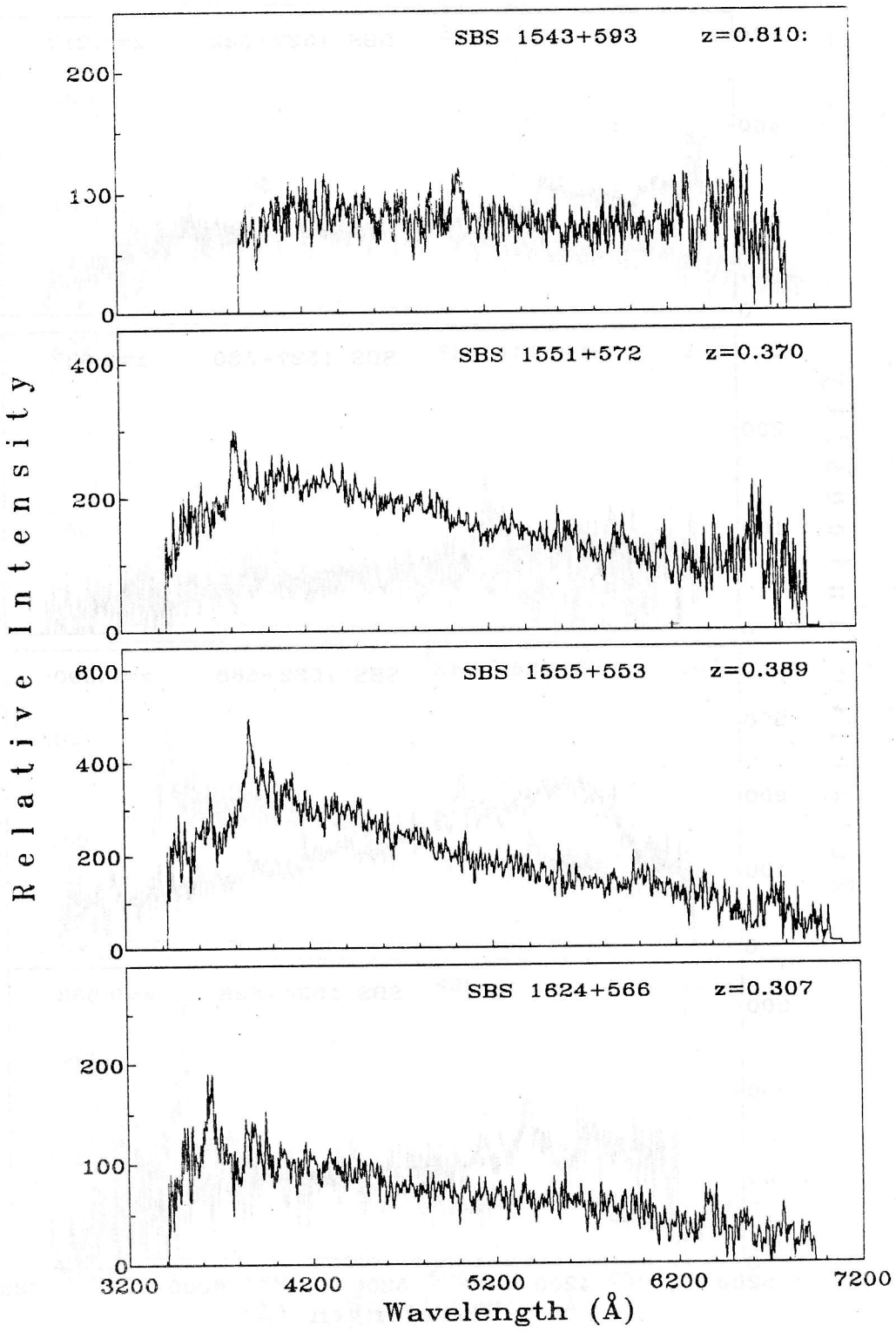

SBS 1421+511
z=0.276
SBS 1424+502
z=0.414:
SBS 1426+506
z=1.016
SBS 1437+509
z=1.993
Relative Intensity
Wavelength (Å)
600
400
200
0
200
100
0
100
50
0
150
100
50
0
3200
4200
5200
6200
7200


SBS 1439+522 z=0.318
SBS 1458+534 z=0.341
SBS 1500+557 z=1.161
SBS 1501+506 z=0.537:
Relative Intensity
Wavelength (Å)
0
100
200
300
400
3200
4200
5200
6200
7200


SBS 1503+570 z=0.360
SBS 1504+543 z=1.912
SBS 1508+585 z=1.770
SBS 1509+522 z=0.210
Relative Intensity
Wavelength (Å)
3200
4200
5200
6200
7200


SBS 1510+517 z=1.637
SBS 1518+497 z=0.476:
SBS 1521+598 z=0.289
SBS 1526+540 z=1.384
Relative Intensity
Wavelength (Å)
0
50
100
150
200
3200
4200
5200
6200
7200


SBS 1527+522 z=1.212
SBS 1527+530 z=0.637:
SBS 1532+588 z=0.690:
SBS 1534+528 z=0.563
Relative Intensity
Wavelength (Å)
3200
4200
5200
6200
7200


SBS 1543+593 z=0.810:
SBS 1551+572 z=0.370
SBS 1555+553 z=0.389
SBS 1624+566 z=0.307
Relative Intensity
Wavelength (Å)
3200
4200
5200
6200
7200