

Optical Variability of Seyfert Nuclei. III. Fourteen years of Photometry and Spectroscopy

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Received; accepted

Abstract. A number of Seyfert type 1 and type 2 galaxies were followed spectroscopically and photometrically during an interval of 14 years, from 1979 till 1993. The observations were done with the 90 cm Dutch telescope, the 1.5 m (ESO) and the 3.6 m telescope at ESO, La Silla. We discuss these observations and present (part of) the data in both tabular form and in figures. The full data set is accessible by electronic means.

Key words: Galaxies: active; Galaxies: Seyfert; Galaxies: photometry; Galaxies: nuclei

1. Introduction

Variability of Seyfert nuclei has turned out to be an important tool in the study of the physics of active nuclei, as is testified by the abundant literature on the subject (see Peterson et al. (eds.) 2001, or Ulrich, Maraschi & Urry 1997). When the programme described in this paper was started not much was known about the variability of spectral lines and optical continuum, although a few studies had been done (e.g. Lyutyi 1973, Penston et al. 1974, de Bruyn 1980, Peterson et al. 1982). Since then it has become clear that intensive monitoring campaigns provide a wealth of information on the structure of the broad line region (BLR). Observed delays between the light curves of continuum and selected emission lines show that the model of photoionization of the BLR by a central ionizing source and stratification of the BLR in layers of different ionization levels is qualitatively almost certainly correct. A recent discussion of the cross-correlation lags and the uncertainties in this method is given by Peterson et al. (1998a).

The profiles of the broad permitted emission lines may change as the continuum varies (Stirpe et al. 1988).

The observed lags between various continuum and line components are typically of the order of days to a few months, which means that delay studies based on observations spaced in intervals of ~ 1 year are only meaningful

if the light curves are very regular, with variability time scales not much smaller than that. In our sample only Fairall 9 and Markarian 590 fulfil this condition. We gave an analysis of the time-lags found for Fairall 9 in Lub & de Ruiter (1992).

The data presented here are therefore more useful to study the long term behaviour of Seyfert galaxies, their degree of variability, and the differences between the spectra of high and low activity states. This database should give a fairly representative sampling of the various stages of activity in Seyfert type 1 galaxies, as well as upper limits to possible changes in the continuum and spectrum of type 2 Seyfert galaxies.

In Sect. 2 we describe the sample of Seyfert galaxies used in this project, and the photometric and spectroscopic observations that were carried out in the fourteen year period 1979-1993. Details about the observations of individual sources are given in Sect. 3, which is followed by a brief summary (Sect. 4).

2. The Observations

The observations were done at the European Southern Observatory. Spectra were obtained during the period December 1979 - December 1993, using the the 3.6 m in the first three periods and the 1.5 m ESO telescope from 1982 till 1993, while photometry was carried out with the Walraven *VBLUW* photometer, mounted on the Dutch 90 cm telescope.

In March 1991 the Walraven photometer was mothballed after almost 32 years of service. The Dutch telescope then was equipped with a standard CCD camera provided by ESO. An attempt was made to continue the photometric monitoring of the sources in our sample using this camera and (U) B V broadband filters. However it became soon clear that the photometry which could be reconstructed by integrating the CCD images over the effective diaphragm of the photometer, would in no way match the Walraven photometry. This project was then abandoned, as the images also would not add anything to what was already available in the literature.

Table 1. The Sample of Seyfert Galaxies

Nr	Name		R.A. (2000)	Dec. (2000)	redshift
01	TOL0109-383	2	01 11 27.64	-38 05 00.5	0.01171(7)
02	FAIRALL 9	1	01 23 45.71	-58 48 20.6	0.04583(5)
03	MKN 573	2	01 43 57.75	+02 21 00.0	0.01723(3)
04	MKN 590	1	02 14 33.06	-00 46 07.5	0.02663(14)
05	NGC 1068	2	02 42 40.63	-00 00 47.3	0.00290(10)
06	MKN 609	1	03 25 25.35	-06 08 39.1	0.03406(7)
07	NGC 1566	1	04 20 00.65	-54 56 17.2	0.00495(5)
08	3C 120	1	04 33 10.97	+05 21 17.0	0.03298(4)
09	MKN 618	1	04 36 22.26	-10 22 33.9	0.03502(14)
10	AKN 120	1	05 16 11.42	-00 08 59.9	0.03255(6)
11	NGC 3783	1	11 39 01.75	-37 44 18.5	0.00961(5)
12	NGC 4507	2	12 35 36.51	-39 54 33.1	0.01176(7)
13	IC 4329A	1	13 49 19.25	-30 18 33.8	0.01569(12)
14	NGC 7469	1	23 03 15.65	+08 52 28.3	0.01562(8)
15	MCG-2-58-22	1	23 04 43.46	-08 41 07.5	0.04698(4)
16	NGC 7603	1	23 18 56.30	+00 14 46.2	0.02909(2)

The photometry was usually done as close as possible in time to the spectroscopy (typically within one or two weeks). Since strong variations in the continuum or emission lines are not expected on this time scale, the very accurate photometric observations should give a good indication of the absolute level of the continuum.

We basically observed the Seyfert galaxies that were known before 1979, were accessible from La Silla in summer and bright enough to be observed with the Dutch 90 cm telescope. The names, positions (epoch J2000) and redshifts of the sixteen Seyferts are given in Table 1. The redshifts were determined using the spectra described in the present paper, and are heliocentric. The number in parentheses after the redshift (column 6) gives the error in the last decimal(s).

Table 1 also reports the original Seyfert spectral type (in column 3), as it was known and defined at the start of our programme (in 1979). Although the type 1 Seyfert nuclei were observed most frequently, a number of type 2 Seyferts were also followed during this period, in order to investigate possible long term (> 10 years) variations.

2.1. VBLUW Photometry

Preliminary photometric data for the first three years of observations were given in de Ruiter & Lub (1986). Since in the meantime the Walraven VBLUW system had been considerably improved, a final reduction of all data was recently done, including the first years. Therefore in this paper we present photometry done in the entire period 1979–1991 with the Walraven photometer. We report here only photometry done with an aperture of 11.6 arcsec, although all objects were also occasionally observed with a 16.5 arcsec aperture, and, albeit more rarely, with the other available diaphragms (8.3, 21.5, 28.1 arcsec).

Details on the Walraven VBLUW photometric system can be found in de Ruiter & Lub (1986) and Lub & de Ruiter (1992). In Table 2 we give some information about the system plus some useful conversion fac-

Table 2. The Walraven VBLUW Photometric System

	<i>V</i>	<i>B</i>	<i>L</i>	<i>U</i>	<i>W</i>
λ_{eff} (Å)	5441	4298	3837	3623	3235
$\Delta\lambda$ (Å)	708	423	221	232	157
C_ν	3.822	3.879	3.873	3.848	3.870
C_λ	-11.172	-10.910	-10.818	-10.793	-10.673

tors. Since the Seyfert nuclei are usually not very red the Walraven *V* can be converted quite accurately (typically within 0.01 mag) to V_J , the visual magnitude of the standard Johnson photometric system, by the formula $V_J = 6.886 - 2.5V - 0.082(V - B)$ (see also Lub & de Ruiter 1992). The third and fourth row of Table 2 give the constants that should be added to the Walraven values to get the flux in mJy or in $\text{erg s}^{-1}\text{cm}^{-2}\text{\AA}^{-1}$, for example $\log(S_V/\text{mJy}) = V + C_\nu(V)$; thanks to the relatively blue colours (typically $V - B < 0.5$), these conversions should be very accurate ($\sim 1\%$). In order to avoid misunderstandings we stress that by convention the Walraven indices represent the logarithm of intensity, and therefore a larger value of, for example, *V* corresponds to a stronger intensity.

As much as possible we tried to do a photometric observing sequence (see de Ruiter & Lub 1986) for each object on every night of an observing session. The length of these sessions varied from one to two weeks, so that the number of observing sequences per object could in principle be between 7 and 14. Due to various reasons (e.g. bad weather) the number of observing sequences per object was usually somewhere between 1 and 10. One observing sequence consists of two independent observations, which were averaged to give one individual measurement. In Table 3 we give the photometric data averaged over each observing session. This averaging is justified, since we never found any evidence for variations in the photometry at a level > 0.01 mag in any observing session. The uncertainties are given as well; these were determined as the standard deviation of the individual measurements in each period, or, in case at most two points were available, the expected error of an observing sequence (see de Ruiter & Lub 1986).

In Figs. 3–10 we show the light curves as determined for the time interval between December 1979 and 1992, for *V* and the colour-indices $V - B$, $B - L$, $L - U$ and $U - W$.

The photometric light curves allow us to analyze if there is any significant variation, and if so, the characteristic times scales involved. To this end we used the light curves in the Walraven *V* band and determined their power spectra. These are given in Fig. 11.

It can be seen that variability in some cases is completely absent (as expected mostly in type 2 Seyferts), sometimes weak and chaotic (e.g. Arakelian 120), and in some other objects strong and rather regular (examples

are Fairall 9 and Markarian 590). Within our observing window of 14 years the variations in Fairall 9 and Markarian 590 even appear to follow a sine curve, although we stress that of course this does not mean that they will always show this behaviour. Many objects do vary with time scales much shorter than the observing interval, but others show also a secular change on top of that: for such objects the variations are therefore on much larger scales than 10-15 years. A summary of time scales and their amplitudes is given in Table 4. A more detailed description of the variability properties of each object in our sample can be found in Section 3.

2.2. Spectroscopy

Usually almost simultaneously (i.e. within days or at most a few weeks) spectra were taken of the Seyferts in our sample. In the first three years spectra were taken with the IDS mounted on the 3.6 m telescope, from 1982 till 1987 with the IDS on the 1.5 m spectroscopic telescope. In 1987 the IDS was substituted with various CCD's. A summary of all spectroscopic observing sessions is given in Table 5. The table gives the observing date in column 1 (format yymmdd), the telescope (either the 3.6 m or 1.5 m) and detector (either the IDS or a CCD) in column 2, the wavelength range in column 3 and wavelength step ($\text{\AA}/\text{pixel}$) in column 4; a plus sign in columns 3 through 18 indicates that a spectrum for a specific object is available. The object name can be found through the corresponding number in column 1 of Table 1.

The spectra were wavelength and flux calibrated, with the help of HcAr comparison arcs and with standard stars, using the IHAP package of ESO, and later on IRAF. As an additional step the spectra were brought on the same flux scale by requiring that the [OIII] $\lambda 5007$ line have not varied and should have the same flux in all the spectra of an object. Although this may lead to some uncertainties (because neighbouring FeII blends do vary, see Baribaud & Alloin 1990), we made an additional check by comparing the level at the continuum $\sim 3800 \text{\AA}$ with the value of the Walraven L (see also Lub & de Ruiter 1992). In general the differences between the spectral should not amount to more than 5 %, while a similar error is expected in the absolute value of the flux scale.

In each observing session we tried to cover all objects from ~ 3700 to $\sim 7000 \text{\AA}$. In the early years this meant that we had to take a red and a blue spectrum separately, in order to get a sufficiently high resolution ($5 - 10 \text{\AA}$). In later years the CCD's were such that the whole wavelength range could be covered in one observation. For obvious reasons of space we cannot show here all the spectra available, and we only give a list of all the spectra that were taken over the years in Table 5. The spectra are available in FITS format at request from the authors, or can be downloaded from the Web (see Sect. 2.3).

In Tables 6 to 20 we give the emission lines found in our programme objects, and their fluxes and equivalent widths. In many cases a gaussian fit of a line was made, and the FWHM of the line is shown.

In order to get an idea of the spectral characteristics, we give in Figs. 12-14, for each Seyfert galaxy the spectrum when the object was brightest and when it was faintest. The differences in the spectra for those objects that did not vary therefore give a good idea of the quality of our spectroscopic data.

2.3. Electronic availability of the data

Table 3 (photometry) and Tables 6 to 20 are available in electronic form at the CDS via anonymous ftp to cdsarc.u-strasbg.fr, or via the CDS web site. We have also created the possibility to download the spectra (in FITS format) from the page:

http://boas5.bo.astro.it/~deruiter/seyf_spectable.html;

moreover this page offers the opportunity to watch animations of the time sequence (from 1979 till 1993) of the spectral region around $H\beta$, or to have a direct look at the spectra. This is true for all our programme objects.

Although it is difficult to guarantee that the address of these Web pages will remain unaltered for many years, it is our intention to continue providing accessibility of the spectra.

3. Discussion of individual sources

3.1. Tololo 0109-383

This object was originally classified as a type 2 Seyfert (see Table 1), but a broad $H\alpha$ component was found by Boisson & Durret (1986). The presence of broad components ($H\alpha$, $H\beta$ and even FeII features) was confirmed by Murayama, Taniguchi & Iwasawa (1998), according to whom the evidence points to an incompletely hidden type 1 nucleus. They state that the ratio of soft X-ray to IR (at $60 \mu\text{m}$) is a factor of about two higher than normally found in type 2 Seyferts, which may be explained by an incomplete blocking of the nucleus by a dusty torus. Whatever the case may be, there is no evidence for the presence of a variable type 1 nucleus in our photometric and spectroscopic data (see Tables 4 and 6).

Wilson & Nath (1990) find FWHM of the emission lines in the range 500 to 900 km/s, similar to the values given in Table 6: 700 km/s for [O III] ($\lambda 5007$) to 800 km/s for $H\beta$, and 700-1400 km/s for $H\alpha$ (which was not deconvolved). Murayama, Taniguchi & Iwasawa (1998) find that the flux in the *narrow* component of $H\beta$ is $4.00 \times 10^{-14} \text{ erg s}^{-1} \text{ cm}^{-2}$ against our average value of $(7.6 \pm 1.3) \times 10^{-14} \text{ erg s}^{-1} \text{ cm}^{-2}$. The difference is the broad component, because we did not deconvolve the line.

3.2. Fairall 9

Data on the emission lines were already given in Lub & de Ruiter 1992 and are not repeated here. We do give the VBLUW photometric data in Table 3, since some more measurements are included with respect to the previous paper.

Numerous monitoring programmes have been dedicated to Fairall 9, in some cases exclusively to this object, which, at the time of its discovery, very much resembled a nearby quasar. Virtually all reported strong variations in continuum as well as emission lines, although not all papers agree on the amount; for example, Winge et al. (1996) monitored Fairall 9 in 1991 and 1992 and reported strong variations, while Winkler (1992), in the period 1986-1990 found variations that never exceeded 20 % in the broad line fluxes. These results obviously depend entirely on the period of observation, and its strong variability is a characteristic in the period 1979-1992, with factors of ~ 5 in the optical continuum and ~ 10 in the Balmer line fluxes. The characteristic time scale of the variations is about 8 years (Table 4).

In Lub & de Ruiter (1992) we discussed the time lags between the continuum and emission line variations, which could be determined thanks to the particularly regular behaviour of the variations in the period 1979-1990. Typically the Balmer lines are delayed by $\sim 6 - 12$ months, and there is strong evidence that the lags are not the same for all lines, which points to a stratification of the Broad Line Region. Santos-Lleó et al. (1997) found variations of the continuum at $5340 \text{ \AA}$ of $\sim 12\%$, with time scale ~ 20 days; in 94 days the changes were as high as a factor 2. Our data do not cover periods in that range, but the changes reported (for example a change in the $H\beta$ flux of $> 20\%$) are in perfect agreement with our more sparsely sampled light curves. It should be said, however, that according to Santos-Lleó et al. (1997) the lag between $H\beta$ and the continuum was about 23 days, much shorter than previously suggested by for example Lub & de Ruiter (1992), Clavel et al. (1989) and Koratkar & Gaskell (1989).

No significant lags were found between the continuum at different wavebands, in line with the results reported by Peterson et al. (1998b) who did not find significant interband lags between 1825, 4845 and $6962 \text{ \AA}$, by Recondo-González et al. (1997) who showed that optical variations did not lag behind the very large changes in the UV (a factor of 33 on a time scale of about 6 months), and by Santos-Lleó et al. (1997), who remark that the light curves in the optical and UV resemble each other and show no measurable lags. According to Recondo-González et al. (1997) near IR observations support previous claims of $0.02 M_{\odot}$ of dust at about 400 light days.

All data on the time delays between continuum and emission lines appear to concur that the BLR in Fairall 9 is stratified and should have an overall size of the order of a light year.

Nishiura, Murayama & Taniguchi (1998) estimate from model fitting of Fe K emission a probable inclination angle of the accretion disk, for 18 type 1 Seyferts including Fairall 9. They conclude that more face-on accretion disks (small inclination angle) tend to have larger BLR velocity widths, suggesting that the BLRs are not coplanar with respect to the accretion disk. Fairall 9 should be one of the more face-on accretion disk objects ($\sim 45^\circ$).

3.3. Markarian 573

This type 2 Seyfert galaxy, a barred spiral of type SB0 (Xanthopoulos 1996), has been observed rather irregularly by us; there is no sign at all of any variability. The emission lines are relatively narrow, of the order of $350\text{-}400 \text{ km s}^{-1}$, in agreement with Wilson & Nath (1990). Feldman et al. (1982) determined a slightly lower FWHM of $H\alpha$ ($304 \pm 20 \text{ km s}^{-1}$).

3.4. Markarian 590

After Fairall 9 this is the object that has shown the strongest and most regular variation, and, as it happens, almost with the same time scale as Fairall 9 (8.7 years, see Table 4). However, here the similarity with Fairall 9 ends. Markarian 590 is a spiral galaxy of type Sa with absolute I magnitude (within an aperture of 10 kpc) $M = -22.52$ ((Xanthopoulos 1996) and is therefore much less luminous than Fairall 9; the derived time lags and size of the BLR (see Peterson et al. 1998a) are much smaller (~ 20 days) than in Fairall 9.

3.5. NGC 1068

Although classified as a type 2 Seyfert, it is known that a type 1 nucleus is hidden, behind a torus of dust: the AGN is seen indirectly in polarized light (Miller, Goodrich & Mathews 1991). Wilson & Nath (1990) report FWHM of emission lines in the range $1000 \pm 300 \text{ km s}^{-1}$ in agreement with the line widths determined from our spectra.

There is a hint of a long term change in the continuum intensity, at a time scale > 10 years (Table 4), but unfortunately we have only very few points; anyway the amplitude should be very small ($\Delta m < 0.02$).

3.6. Markarian 609

This S0 galaxy (Xanthopoulos 1996) has shown some periods with a higher state of activity (in particular in the early eighties), but overall the amplitude of the variations has been rather small. The characteristic time scale is of the order of 3-4 years (Table 4). The broad component of $H\beta$ and $H\alpha$ is weak compared to the narrow components (see Fig. 12).

3.7. NGC 1566

NGC 156 is a large spiral galaxy, showing a (pseudo) ring and a weak bar Xanthopoulos (1996), which was in a state of activity in the early phases of our monitoring programme, but since then has quieted down (Fig. 6), up to the point that after 1983 $H\beta$ became a factor 5-10 weaker, and stayed at this low level (see Table 11). NGC 1566 has been studied in detail by a number of authors, in particular by Alloin and co-workers. Alloin et al. (1986) concluded that it has a relatively small broad line region (about 20 light days), and spends most of its time in a state of low activity, which may last from a few months up to a year; periods of activity do not last more than a few weeks and consist in a series of rapid bursts. However, as can be seen from the light curves in Fig. 6, and from the power spectrum (Fig. 11), there is also evidence for changes at much longer time scales, around 6 years and possibly at > 15 years (Table 4).

There is therefore strong short-term variation, especially at shorter wavelengths, up to 40 % in the X ray band (Baribaud et al. 1992, see also Penfold 1979 and de Ruiter & Lub 1986), due to an AGN which radiates at about 0.01 of the Eddington luminosity (Baribaud et al. 1992), and on top of that a more smooth change over longer time scales.

3.8. 3C 120

The radio galaxy 3C 120 (an S0/a pec type, see Xanthopoulos 1996) is different from the other Seyfert galaxies in our sample, because it is the only strong radio emitter, and also shows superluminal motion on parsec scales (see Walker et al. 2001 for a recent discussion of the radio structure). Variability is present in the optical data as well. In earlier data the time scales were found to range from $\sim$ months to many (>10) years (Cannon, Penston & Brett 1971, Lyutyi 1979). The shorter time scales have been confirmed by Peterson et al. (1998a), who determined a size of about 44 light days for the broad line region. The long term changes over the period 1979-1992 have not been very big, but nevertheless significant, with time scales of 3 to 6 years (Table 4).

3.9. Arakelian 120

Arakelian 120, an S0/a pec type galaxy (Xanthopoulos 1996) has a very interesting emission line spectrum: the broad emission lines, in particular $H\beta$ show much structure; in fact, in certain periods $H\beta$ was doubly peaked. The variability behaviour was rather erratic, probably because Arakelian 120 is strongly variable at time scales much shorter than our time resolution of one year. This probably explains the different time scales with low amplitude given in Table 4. Alloin, Boisson & Pelat (1988) distinguish two distinct regions in the broad line region,

one of which is the accretion disk. The BLR has a size of about 2 light months. Their analysis is based on the period 1977-1988, which almost entirely overlaps with the monitoring data presented here. Peterson & Gaskell (1991) analyze the continuum and emission line variations in the UV and optical and found a lag of 39 ± 14 days between the continuum lines, while Peterson, Korista & Wagner (1989) find no reliable evidence of continuum and emission line variations on time scale shorter than 20 days, but substantial evidence for real variations on scales of 20-40 days. Also Peterson et al. (1998a) agree on a size of the BLR of the order of one to two light months.

Strong variations in the period 1991-1992 were reported by Winge et al. (1996).

3.10. NGC 3783

A very intensive observing campaign was carried out by Stirpe et al. (1994), between 1991 and 1992. They found that the lag between UV and optical continuum is less than one day, while the lag of $H\beta$ with respect to the continuum was ~ 8 days. A similar conclusion concerning the simultaneity of the UV and optical continuum was reached by Peterson et al. (1998b).

There appear to be several characteristic time scales (Table 4), in the range 2-6 years, but NGC 3783 is one of the best examples of variability on longer times (> 15 years), as can be seen from Fig. 8, the nucleus having progressively brightened by about 0.7 mag.

Alloin et al. (1995) produced a snapshot spectrum of the continuum from γ to radio frequencies; the spectrum shows two bumps, one in the UV, which presumably is due to thermal emission from the accretion disk, while the second bump, in the IR, should come from dust in the form of hot grains ($T_d \sim 1500$ K). This region is much larger and extends from about 80 light days to 60 light years.

3.11. NGC 4507

There are no signs of variation in the spectrum, nor does the Walraven photometry give convincing evidence of variability. Although the $U - W$ colour might give the impression that the object has become bluer over the years (see Fig. 8), this is most likely due to the difficulty of measuring the U and W indices in this very red object. The errors given in the figure are therefore underestimated.

3.12. IC 4329A

According to Malzac et al. (1998) the accretion disk of this galaxy is inclined by $\sim 80^\circ$, i.e. close to edge-on, but Nishiura et al. (1998) give 20° as a probable inclination angle. It is well known, anyway, that this Seyfert 1 nucleus suffers from heavy internal reddening, and the redness of the continuum is easily seen in Fig. 14.

Winge et al. (1996) analysed spectra taken in the period January till July 1992 and found the object moderately variable, in agreement with the our data, in which the maximum ΔV is of the order of 0.25 magnitudes, over a period of 10 years.

3.13. NGC 7469

NGC 7469 is an SABa pec galaxy with a starburst circum-nuclear ring (Salamanca, Alloin & Pelat 1995), which has been studied extensively for variability by many different groups (e.g. Cannon et al. 1971, Pronik, Metik & Merkulova 1997, Peterson et al. 1982, Glass 1998, Salamanca, Alloin & Pelat 1995).

There is evidence for a low level secular change (of order 0.05 mag) in our data (see Table 3 and Table 4), in agreement with the photometric study of Glass (1998), who found that changes over a 13 year period were generally small (< 0.3 mag), except for an event in 1989, when the flux decreased to about a quarter of its usual level. Unfortunately no data were taken by us in 1989, although it should be remarked that in December 1988 the galaxy was at the lowest level of the whole period 1979-1990.

NGC 7469 is known to exhibit short term variability; Peterson et al. (1998b) found that there are lags of 0.22 to 1.8 days between the continuum changes at different wavelengths, from 1315 Å to 6962 Å. Salamanca, Alloin & Pelat (1995) suspect flickering activity, with an increase of flux as high as 30 % in two days. They also concluded that the broad wings of the Balmer lines (with FWHM of 7500 km s⁻¹) may vary on time scales of a few days. Of course, our data are not adequate to detect such short term activity, but variations on time scales of several years to > 10 years are definitely present.

3.14. MCG-2-58-22

MCG -2-58-22 is a well known X ray source (see e.g. Weaver et al 1995).

Our photometry shows that its nucleus has become progressively weaker by almost 0.7 mag, from the early eighties till around 1990, as can be seen from Fig. 10. The spectrum has undergone drastic changes as well (Fig. 14).

3.15. NGC 7603

NGC 7603 has been known for a long time to have a highly variable emission line spectrum (Tohline & Osterbrock 1976), and its behaviour has been confirmed by our data (see for example the variation, by as much as a factor 6 of $H\beta$, as can be seen in Fig. 14). However, the continuum variations were nowhere near as spectacular (see Table 3 and Fig. 10).

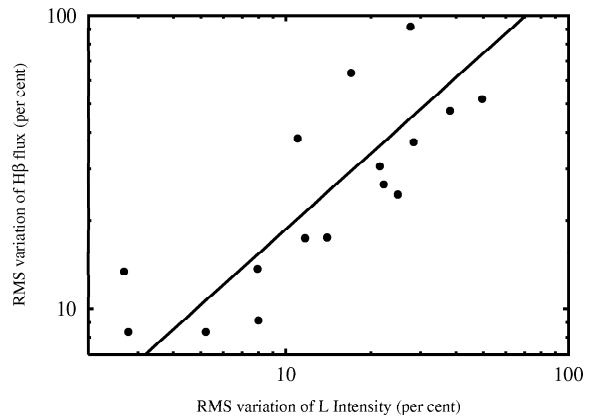


Fig. 1. RMS Variation of the Walraven L intensity and the line flux of $H\beta$ (in per cent), over the whole period. Each point represents one of the sixteen Seyfert galaxies observed.

4. Summary

The RMS of the measurements of the Walraven intensities and of the emission lines ranges from a few per cent (in the case of type Seyfert 2 galaxies) to almost 100 % for the most variable type 1 Seyferts (in particular Fairall 9 and Markarian 590). In Fig. 1 we illustrate this by plotting the RMS variations of the Walraven L intensity and of the $H\beta$ flux, over the 14 year period in which both Walraven photometry and spectroscopy was done. Also shown is the best fit $\log H\beta \propto 0.86 \times L$: the relation between the strength of the continuum and the $H\beta$ variations is close to linear. Note that the L band is around 3800 Å rest wavelength; considering the typical redshifts in the Seyfert galaxy sample there should be no variable emission lines inside this band and any variations are therefore due purely to the continuum emission.

In Fig. 2 we collected all the light curves of the type 1 Seyferts: each point represents the average values of L and $H\beta$ in an observing period (which are typically separated one year from each other). With some exceptions (notably Markarian 609 = 06 and NGC 1566 = 07) the variations in the continuum and the lines are linearly correlated. It should be said, however, that in both these objects $H\beta$ was sometimes quite faint and difficult to measure.

In this paper we have presented photometric and spectroscopic data on a sample of 16 Seyfert galaxies, of which 4 are of type 2, taken in the period 1979–1993 at ESO, La Silla. The data are available either as tables, which can be retrieved electronically in the usual way, or as data files, which can be downloaded (in FITS format), from the address given above.

Acknowledgements. We thank the Dutch telescope programme committee and ESO for providing us with ample observing time on the Dutch 90 cm telescope, simultaneous with the spectroscopic observations.

A few measurements at the Dutch telescope were taken by Leiden students. We thank especially H. Linders.

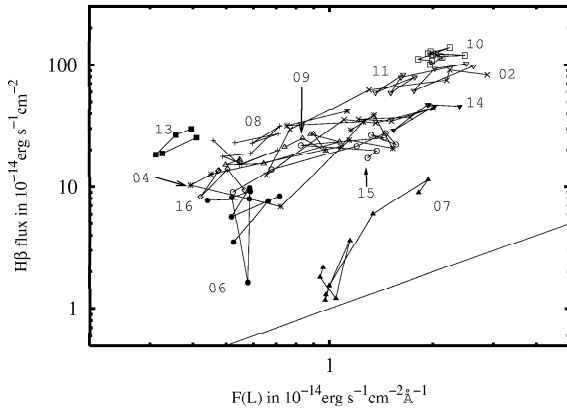


Fig. 2. The variations of $H\beta$ and the Walraven L intensity. Each point represents the average values of L and $H\beta$ in an observing period. Only the Seyfert 1 galaxies are shown. The numbers identify the galaxies according to Column 1 of Table 1.

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Table 3. Walraven *VBLUW* Photometry

Name	Date	V σ_V	$V - B$ σ_{V-B}	$B - L$ σ_{B-L}	$L - U$ σ_{L-U}	$U - W$ σ_{U-W}
TOL 0109-383	79.958	-3.031 ±.006	0.429 ±.003	0.206 ±.016	0.089 ±.018	0.217 ±.077
	80.608	-3.029 .012	0.423 .007	0.226 .010	0.071 .008	0.193 .025
	80.944	-3.019 .004	0.423 .004	0.208 .005	0.115 .023	0.109 .040
	81.905	-3.025 .006	0.431 .005	0.212 .007	0.068 .006	0.227 .019
	88.934	-3.024 .010	0.427: .005	0.005 -	- -	- -
	79.958	-2.638 .008	0.131 .003	-0.072 .004	-0.051 .006	0.026 .007
	80.120	-2.666 .010	0.150: .005	-0.051: .005	-0.042: .010	0.150: .010
	80.610	-2.660 .007	0.137 .003	-0.075 .006	-0.048 .007	0.037 .004
	80.945	-2.710 .014	0.176 .005	-0.055 .005	-0.050 .004	0.048 .008
	81.905	-2.747 .008	0.156 .005	-0.057 .004	-0.052 .006	0.042 .008
Fairall 9	81.992	-2.739 .006	0.154 .002	-0.053 .002	-0.043 .005	0.031 .004
	82.958	-2.886 .008	0.216 .008	-0.035 .010	-0.059 .004	0.045 .007
	83.112	-2.896 .010	0.195: .005	-0.021: .005	-0.035: .010	0.021: .010
	83.479	-3.001 .010	0.297: .005	-0.005: .005	-0.082: .005	0.035: .010
	83.938	-2.997 .012	0.277 .006	0.022 .014	-0.053 .009	0.033 .004
	84.740	-3.109 .010	0.343: .005	0.099: .005	-0.055: .005	0.054: .010
	84.884	-3.073 .019	0.319 .007	0.076 .018	-0.048 .005	0.052 .004
	84.984	-3.022 .005	0.282 .003	0.061 .008	-0.048 .011	0.040 .012
	85.947	-2.934 .004	0.226 .002	-0.021 .002	-0.047 .002	0.043 .004
	86.927	-2.866 .007	0.203 .004	-0.022 .006	-0.036 .010	0.051 .013
MKN 573	88.044	-2.756 .026	0.154 .013	-0.030 .012	-0.037 .013	0.085 .035
	88.936	-2.843 .004	0.194 .002	-0.036 .002	-0.051 .006	0.060 .012
	89.982	-2.906 .005	0.215 .005	-0.024 .017	-0.034 .007	0.073 .015
	90.818	-2.815 .026	0.164 .005	-0.032 .009	-0.035 .008	0.032 .041
	91.064	-2.830 .006	0.175 .015	-0.030 .008	-0.040 .004	0.060 .007
	80.610	-2.934 .011	0.474 .005	0.162 .022	0.113 .031	0.148 .052
	80.944	-2.924 .004	0.470 .012	0.153 .037	0.148 .010	0.222 .004
	81.910	-2.924 .022	0.482 .008	0.138 .004	0.185 .042	0.232 .013
	86.934	-2.929 .010	0.485: .005	0.129: .005	0.169: .005	0.250: .010
	88.934	-2.926 .010	0.472: .005	0.141: .005	0.231: .005	-0.115: .010
MKN 590	89.992	-2.944 .010	0.497: .005	- -	- -	- -
	79.964	-2.877 .004	0.323 .007	0.065 .006	-0.040 .007	0.054 .019
	80.610	-2.833 .006	0.269 .006	0.028 .005	-0.048 .011	0.029 .004
	80.951	-2.886 .010	0.342: .005	0.077: .005	-0.025: .005	0.066: .010
	81.910	-2.809 .010	0.266 .005	0.008 .004	-0.043 .007	0.037 .005
	82.959	-2.843 .004	0.273 .005	0.032 .010	-0.036 .004	0.035 .028
	83.942	-3.004 .010	0.388: .005	0.134: .005	0.023: .005	0.078: .010
	84.980	-2.963 .004	0.418 .003	0.206 .002	0.019 .014	0.081 .019
	85.948	-2.904 .010	0.341: .005	0.080: .005	-0.010: .005	0.065: .010
	86.927	-2.823 .006	0.271 .004	0.030 .005	-0.039 .007	0.040 .007
NGC 1068	88.042	-2.774 .007	0.227 .006	-0.004 .008	-0.041 .002	0.027 .008
	88.936	-2.724 .015	0.205 .002	-0.020 .004	-0.049 .004	0.047 .034
	89.984	-2.791 .038	0.261 .007	0.000 .005	-0.048 .027	0.091 .011
	90.868	-2.866 .010	0.245: .005	0.008: .005	-0.042: .005	-0.029: .010
	91.059	-2.812 .009	0.275 .013	0.005 .027	-0.045 .011	0.042 .011
	80.607	-1.751 .005	0.395 .003	0.167 .004	0.163 .004	0.163 .004
	80.937	-1.754 .010	0.397: .005	0.174: .005	0.107: .005	0.174: .010
	81.916	-1.753 .009	0.400 .006	0.170 .003	0.111 .006	0.167 .006
	87.328	-1.769 .012	0.394 .002	0.172 .003	0.107 .002	0.168 .004
	89.992	-1.787 .010	0.400: .005	0.186: .005	0.111: .005	0.187: .010

Table 3. *VBLUW* photometry (continued)

Name	Date	V σ_V	$V - B$ σ_{V-B}	$B - L$ σ_{B-L}	$L - U$ σ_{L-U}	$U - W$ σ_{U-W}
MKN 609	79.962	-2.974 .015	0.270 .010	0.159 .002	0.033 .005	0.061 .046
	80.607	-2.998 .010	0.263: .005	0.202: .005	0.026: .005	0.050: .010
	80.945	-2.911 .004	0.277 .002	0.173 .006	0.065 .005	0.087 .016
	81.910	-2.946 .007	0.256 .009	0.126 .003	0.030 .005	0.090 .005
	82.960	-3.008 .015	0.289 .010	0.171 .016	0.079 .012	0.196 .021
	83.934	-2.965 .010	0.275: .005	0.175: .005	0.050: .005	0.104: .010
	84.982	-2.971 .013	0.281 .002	0.168 .019	0.043 .022	0.130 .010
	85.948	-3.011 .010	0.291: .005	0.165: .005	0.073: .005	0.102: .010
	86.924	-2.977 .006	0.271 .008	0.171 .002	0.044 .004	0.072 .020
	86.933	-2.974 .004	0.278 .002	0.161 .008	0.040 .002	0.103 .019
NGC 1566	88.046	-2.975 .006	0.266 .009	0.172 .010	0.028 .017	0.111 .030
	88.933	-2.984 .007	0.275 .017	0.159 .002	0.080 .020	0.090 .011
	89.986	-2.992 .023	0.271 .006	0.153 .016	0.076 .023	0.141 .074
	90.833	-3.094 .056	0.270 .005	0.174 .025	0.027 .003	0.134 .066
	91.038	-2.984 .010	0.278: .005	0.174: .005	0.073: .005	0.129: .010
	79.957	-2.421 .007	0.397 .004	0.250 .007	0.056 .007	0.134 .047
	80.611	-2.434 .004	0.414 .004	0.283 .002	0.086 .008	0.213 .041
	81.908	-2.380 .010	0.357 .004	0.186 .009	0.028 .004	0.144 .012
	82.956	-2.373 .005	0.348 .005	0.174 .008	0.017 .006	0.127 .010
	83.933	-2.421 .006	0.391 .005	0.244 .005	0.054 .002	0.170 .004
3C 120	84.984	-2.455 .006	0.418 .005	0.310 .005	0.090 .011	0.223 .013
	85.947	-2.476 .006	0.424 .002	0.296 .004	0.095 .005	0.235 .006
	86.927	-2.462 .010	0.418 .004	0.314 .012	0.086 .008	0.243 .029
	88.044	-2.449 .020	0.403 .003	0.272 .012	0.066 .014	0.184 .025
	88.933	-2.451 .004	0.411 .003	0.303 .002	0.090 .005	0.191 .004
	89.987	-2.476 .014	0.419 .002	0.315 .011	0.086 .019	0.205 .018
	90.953	-2.476 .004	0.414 .016	0.311 .011	0.094 .005	0.249 .024
	91.105	-2.471 .004	0.411 .007	0.308 .003	0.070 .005	0.246 .019
	79.970	-3.308 .004	0.368 .004	0.010 .012	0.001 .006	0.038 .008
	80.945	-3.152 .032	0.315 .017	-0.010 .007	-0.004 .020	0.098 .007
MKN 618	81.911	-3.086 .006	0.265 .007	-0.020 .003	-0.022 .008	0.096 .021
	82.967	-3.118 .010	0.294: .005	-0.006: .005	-0.049: .005	0.095: .010
	83.942	-3.123 .010	0.235: .005	-0.032: .005	0.000: .005	0.099: .010
	84.978	-3.143 .010	0.301: .005	-0.033: .005	-0.004: .005	0.091: .010
	85.948	-3.183 .010	0.308: .005	0.001: .005	0.031: .005	0.141: .010
	86.928	-3.159 .011	0.290 .008	-0.013 .014	-0.028 .022	0.079 .027
	88.046	-3.087 .015	0.273 .008	-0.028 .006	-0.021 .005	0.113 .039
	88.934	-3.161 .004	0.308 .005	-0.025 .018	-0.030 .004	0.076 .036
	89.983	-3.164 .006	0.302 .007	0.054 .045	-0.004 .057	0.245 .013
	79.958	-3.115 .007	0.196 .011	0.011 .011	-0.019 .008	0.061 .014
MKN 618	80.949	-3.121 .058	0.246 .009	0.075 .020	-0.010 .012	0.079 .022
	81.918	-3.172 .004	0.236 .003	0.035 .010	-0.033 .007	0.070 .012
	82.967	-3.200 .010	0.239: .005	0.052: .005	0.008: .005	0.039: .010
	83.945	-3.185 .010	0.239: .005	0.060: .005	-0.046: .005	0.063: .010
	84.985	-3.137 .004	0.216 .005	0.020 .009	-0.031 .005	0.061 .017
	85.948	-2.991 .010	0.165: .005	-0.004: .005	-0.041: .005	0.057: .010
	86.929	-3.049 .009	0.186 .007	0.002 .004	-0.021 .012	0.049 .010
	88.044	-3.056 .017	0.179 .005	-0.007 .008	-0.040 .023	0.058 .019
	88.933	-3.025 .004	0.171 .002	-0.004 .003	-0.041 .002	0.033 .005
	89.982	-3.040 .032	0.183 .033	0.037 .066	-0.045 .017	0.021 .037

Table 3. *VBLUW* photometry (continued)

Name	Date	V σ_V	$V - B$ σ_{V-B}	$B - L$ σ_{B-L}	$L - U$ σ_{L-U}	$U - W$ σ_{U-W}	
MKN 618 (cont'd)	90.871	-3.123 .010	0.167: .005	0.022: .005	-0.022: .005	-0.054: .010	
	91.029	-3.121 .004	0.213 .006	0.020 .002	-0.024 .004	0.066 .005	
	91.107	-3.115 .008	0.205 .003	0.021 .006	-0.039 .004	0.031 .016	
AKN 120	79.959	-2.722 .008	0.177 .008	-0.029 .005	-0.047 .008	0.021 .006	
	80.954	-2.711 .004	0.182 .002	-0.022 .005	-0.046 .003	0.041 .004	
	81.944	-2.655 .009	0.161 .005	-0.029 .005	-0.047 .006	0.036 .004	
	82.967	-2.714 .006	0.175 .005	-0.031 .002	-0.041 .003	0.030 .004	
	83.118	-2.718 .019	0.175 .006	-0.021 .011	-0.048 .006	0.012 .018	
	83.934	-2.737 .016	0.172 .008	-0.015 .002	-0.050 .016	0.041 .008	
	84.030	-2.690 .010	0.170: .005	-0.030: .005	-0.044: .005	0.034: .010	
	84.985	-2.691 .004	0.170 .004	-0.030 .003	-0.044 .003	0.030 .004	
	85.948	-2.747 .010	0.189: .005	-0.013: .005	-0.051: .005	0.027: .010	
	86.927	-2.728 .011	0.177 .003	-0.022 .002	-0.052 .005	0.032 .004	
	88.041	-2.727 .005	0.179 .003	-0.017 .009	-0.046 .004	0.034 .011	
	88.933	-2.704 .006	0.183 .005	-0.034 .002	-0.043 .002	0.050 .004	
	89.980	-2.680 .009	0.187 .018	0.020 .024	0.016 .027	0.153 .029	
	90.823	-2.731 .019	0.182 .014	-0.032 .031	-0.057 .020	0.092 .085	
	91.034	-2.747 .016	0.189 .006	-0.020 .002	-0.052 .003	0.023 .006	
	91.107	-2.704 .010	0.186: .005	-0.021: .005	-0.055: .005	0.035: .010	
	NGC 3783	79.960	-2.679 .019	0.276 .007	0.012 .007	-0.046 .004	0.063 .015
	80.117	-2.712 .010	0.303: .005	0.032: .005	-0.041: .005	0.034: .010	
	80.954	-2.698 .010	0.302: .005	0.048: .005	-0.032: .005	0.049: .010	
	82.970	-2.649 .004	0.266 .002	0.018 .002	-0.043 .002	0.054 .005	
	83.335	-2.628 .023	0.246 .017	0.003 .023	-0.057 .013	0.054 .012	
	83.449	-2.599 .010	0.243: .005	-0.012: .005	-0.057: .005	0.050: .010	
	83.945	-2.683 .010	0.306: .005	0.015: .005	-0.044: .005	0.043: .010	
	84.027	-2.720 .016	0.299 .006	0.031 .007	-0.022 .014	0.029 .012	
	84.120	-2.681 .010	0.283: .005	0.022: .005	-0.016: .005	0.041: .010	
	84.985	-2.670 .015	0.285 .010	0.018 .003	-0.032 .006	0.056 .008	
	85.948	-2.577 .010	0.217: .005	-0.011: .005	-0.058: .005	0.041: .010	
	86.934	-2.633 .010	0.249: .005	-0.001: .005	-0.063: .005	0.022: .010	
	88.041	-2.627 .011	0.239 .010	0.009 .008	-0.057 .004	0.040 .012	
	88.936	-2.645 .008	0.266 .008	0.025 .002	-0.038 .009	0.068 .013	
	89.984	-2.557 .014	0.215 .010	-0.010 .003	-0.051 .003	0.048 .009	
	91.029	-2.578 .005	0.213 .004	-0.013 .002	-0.058 .002	0.040 .004	
	91.111	-2.632 .004	0.257 .004	0.007 .003	-0.058 .003	0.047 .005	
NGC 4507	79.962	-2.803 .017	0.484 .006	0.226 .011	0.081 .005	0.182 .019	
	80.119	-2.777 .004	0.460 .003	0.186 .011	0.127 .002	0.195 .097	
	80.598	-2.774 .011	0.473 .006	0.199 .005	0.123 .008	0.310 .011	
	84.497	-2.780 .016	0.454 .015	0.196 .002	0.113 .002	0.230 .021	
	88.934	-2.775 .010	0.455: .005	0.203: .005	0.094: .005	0.123: .010	
	89.986	-2.785 .013	0.462 .007	- -	- -	- -	

Table 3. *VBLUW* photometry (continued)

Name	Date	V σ_V	$V - B$ σ_{V-B}	$B - L$ σ_{B-L}	$L - U$ σ_{L-U}	$U - W$ σ_{U-W}	
IC 4329A	79.967	-2.862 .010	0.508: .005	-	-	-	
	80.117	-2.819 .010	0.527: .005	0.276: .005	0.095: .005	0.180: .010	
	80.596	-2.798 .010	0.513: .005	0.242: .005	0.120: .005	0.324: .010	
	80.602	-2.801 .021	0.522 .003	0.261 .005	0.094 .020	0.338 .062	
	83.482	-2.828 .010	0.523: .005	0.323: .005	0.051: .005	-	
	84.984	-2.842 .014	0.518 .006	0.269 .009	0.108 .037	0.355 .049	
	88.042	-2.880 .019	0.507 .010	0.300 .021	0.055 .052	0.159 .067	
	88.937	-2.854 .010	0.542: .005	0.272: .005	0.003: .005	-	
	89.981	-2.825 .006	0.534 .002	0.210: .005	0.125: .005	-	
	NGC 7469	79.957	-2.579 .006	0.232 .005	0.037 .007	-0.011 .002	0.062 .034
80.615	-2.604 .005	0.248 .002	0.041 .011	-0.010 .010	0.054 .007		
	81.919	-2.602 .009	0.247 .002	0.041 .004	-0.014 .005	0.050 .021	
	82.951	-2.539 .009	0.213 .011	0.026 .005	-0.017 .004	0.064 .021	
	83.934	-2.566 .010	0.207: .005	0.030: .005	-0.022: .005	0.033: .010	
	85.942	-2.602 .010	0.250: .005	0.045: .005	0.016: .005	0.030: .010	
	86.926	-2.579 .009	0.227 .007	0.038 .005	-0.007 .004	0.049 .008	
	88.936	-2.654 .004	0.271 .002	0.070 .002	0.009 .014	0.048 .020	
	90.833	-2.603 .009	0.229 .011	0.044 .003	-0.001 .008	0.066 .013	
	MCG-2-58-22	79.961	-2.948 .011	0.194 .002	-0.072 .008	0.056 .004	0.056 .015
	80.608	-2.921 .004	0.182 .004	-0.059 .006	-0.022 .005	0.067 .010	
	80.943	-3.005 .010	0.270: .005	-0.010: .005	-0.026: .005	0.116: .010	
	81.918	-3.000 .010	0.220: .005	-0.120: .005	0.007: .005	0.091: .010	
	82.934	-2.904 .010	0.190: .005	-0.072: .005	-0.016: .005	0.073: .010	
	83.474	-3.013 .015	0.220 .016	-0.074 .012	-0.016 .002	0.082 .004	
	83.930	-2.928 .010	0.197 .002	-0.065 .011	-0.002 .014	0.081 .010	
	84.978	-2.851 .010	0.178: .005	-0.041: .005	-0.012: .005	0.118: .010	
	85.945	-2.906 .004	0.183 .008	-0.071 .002	-0.002 .008	0.065 .024	
	86.927	-2.957 .017	0.209 .002	-0.064 .007	-0.017 .009	0.064 .020	
	88.932	-3.096 .006	0.286 .017	-0.032 .006	-0.020 .002	0.078 .013	
	90.833	-3.215 .004	0.298 .005	-0.049 .023	-0.020 .016	0.134 .081	
	NGC 7603	79.960	-3.019 .019	0.344 .004	0.264 .033	0.069: .005	-
80.609	-2.996 .009	0.313 .006	0.197 .009	0.036 .024	0.089 .013		
80.937	-2.993 .010	0.315: .005	0.196: .005	0.056: .005	0.126: .010		
81.919	-3.010 .004	0.331 .008	0.217 .007	0.072 .002	0.134 .033		
83.933	-2.982 .004	0.315 .002	0.181 .003	0.044 .009	0.019 .006		
85.945	-2.974 .011	0.308 .008	0.148 .007	0.027 .002	0.088: .010		
88.936	-2.969 .013	0.299 .007	0.133 .003	0.036 .011	0.032: .010		

Table 4. Variability time scales

Name	τ_{char} years	Ampl.	Reality	Comments
TOL0109-383	-	$< 5 \times 10^{-4}$	absent	No sign of variation
FAIRALL 9	8.00	0.23	present	Clear pseudo-sine
MKN 573	-	$< 10^{-4}$	absent	No sign of variation
MKN 590	8.70	0.093	present	Clear pseudo-sine
NGC 1068	$>10?$	$< 0.002?$	absent?	Marginal evidence for long term change
MKN 609	2.66	0.0069	doubtful	
MKN 609	3.64	0.0081	probable	
MKN 609	6.44	0.0066	doubtful	
NGC 1566	5.70	0.0091	probable	
NGC 1566	>15.4	0.022	present	
MKN 618	13.3	0.077	present	pseudo-sine
3C 120	3.18	0.016	probable	
3C 120	5.72	0.031	present	
AKN 120	2.60	0.0048	doubtful	
AKN 120	3.77	0.0044	doubtful	
AKN 120	7.37	0.0037	doubtful	
NGC 3783	2.19	0.0086	doubtful	
NGC 3783	3.77	0.020	probable	
NGC 3783	6.08	0.0099	doubtful	
NGC 3783	18.1	0.030	present	Lower limit (secular change in data)
NGC 4507	-	$< 10^{-4}$	absent	No sign of variation
IC 4329A	12.0	0.009	probable	Pseudo-sine
NGC 7469	3.77	0.0056	doubtful	
NGC 7469	15.4	0.014	present	Low level secular change
MCG-2-58-22	13.5	0.13	present	secular change
NGC 7603	15.3	0.0038	present	secular change

Table 5. Spectroscopy observing sessions

Date yymmdd	Tel.Det.	λ range Å	step Å/pix	01	02	03	04	05	06	07	Object		08	09	10	11	12	13	14	15	16
791217	3.6IDS	3800-5890	0.50														+	+	+		+
791218	3.6IDS	4900-7030	0.50	+																	+
800825	3.6IDS	3840-7040	1.00	+	+		+	+	+										+	+	+
800826	3.6IDS	3840-7040	1.00	+	+	+												+	+	+	+
801211	3.6IDS	3720-5890	1.00	+	+	+	+	+	+		+	+		+		+	+	+	+	+	+
801212	3.6IDS	4830-7010	1.00	+	+	+		+	+		+	+	+	+		+	+		+	+	+
811223	3.6IDS	3860-5840	1.00	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+
811224	3.6IDS	5000-7070	1.00	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		+	+
821217	1.5IDS	3700-6040	1.00		+		+		+	+	+	+	+	+	+	+	+	+		+	+
831207	1.5IDS	3700-6040	1.00		+					+	+	+	+	+	+	+	+			+	+
831208	1.5IDS	3700-6040	1.00				+		+	+		+	+	+	+	+			+		+
831209	1.5IDS	4780-7090	1.00		+		+				+	+	+	+	+	+					
841224	1.5IDS	3800-6050	1.00		+						+	+	+	+	+	+				+	
841225	1.5IDS	3800-6050	1.00				+		+	+	+	+	+	+	+	+		+		+	+
841226	1.5IDS	3800-6110	1.00									+	+	+	+					+	
841227	1.5IDS	4900-7100	1.00		+					+	+	+	+	+	+	+				+	
851213	1.5IDS	3700-6050	1.10	+					+	+	+	+	+	+	+	+				+	
851214	1.5IDS	3860-6050	1.10				+		+	+	+	+	+	+	+	+			+		+
851215	1.5IDS	4800-7090	1.10		+				+	+	+	+	+	+	+	+			+		+
851216	1.5IDS	4800-7090	1.10		+		+		+	+	+	+	+	+	+	+		+		+	+
861125	1.5IDS	3860-6040	1.30		+		+			+	+	+	+	+	+	+				+	
861126	1.5IDS	3860-6050	1.30							+	+	+	+	+	+	+					
880116	1.5CCD	3950-5650	3.33		+					+	+	+	+	+	+	+		+			
880117	1.5CCD	4480-7020	2.47		+		+			+	+	+	+	+	+	+		+			
880118	1.5CCD	4480-7010	2.47		+		+		+	+	+	+	+	+	+	+		+			
881225	1.5IDS	5740-7470	1.00			+	+		+	+	+	+	+	+	+	+					
881226	1.5IDS	5740-7470	1.00		+		+			+	+	+	+	+	+	+	+	+			
881227	1.5IDS	3760-5410	1.00		+	+				+	+	+	+	+	+	+				+	
881228	1.5IDS	3760-5410	1.00		+			+	+	+	+	+	+	+	+	+	+	+	+		+
891229	1.5CCD	3560-5470	1.87		+		+		+	+	+	+	+	+	+	+			+	+	+
891230	1.5CCD	3620-5530	1.87			+		+	+	+	+	+	+	+	+	+		+	+	+	+
891231	1.5CCD	5280-7200	1.88		+	+	+	+	+	+	+	+	+	+	+	+		+	+	+	+
900101	1.5CCD	3660-5570	1.87	+	+		+		+	+	+	+	+	+	+	+	+			+	+
901213	1.5CCD	3790-5570	1.89		+		+		+	+	+	+	+	+	+	+				+	+
901214	1.5CCD	3790-5720	1.89		+		+	+	+	+	+	+	+	+	+	+				+	+
901215	1.5CCD	3790-5700	1.89		+		+	+	+	+	+	+	+	+	+	+				+	+
901216	1.5CCD	4260-7110	2.79								+								+		
901217	1.5CCD	4030-6880	2.79																		+
911216	1.5CCD	3500-7400	1.90			+				+	+			+	+	+			+		
911217	1.5CCD	3470-7360	1.90		+		+		+	+	+	+	+	+	+	+			+	+	+
911218	1.5CCD	3480-7370	1.90	+				+		+	+	+	+	+	+	+		+	+	+	+
921217	1.5CCD	3390-7280	1.90		+		+		+	+	+	+	+	+	+	+			+	+	+
921218	1.5CCD	3410-7300	1.90	+		+				+	+	+	+	+	+	+		+	+	+	+
921219	1.5CCD	3410-7300	1.90		+			+		+	+	+	+	+	+	+		+	+	+	+
931202	1.5CCD	3420-7330	1.90	+	+				+		+	+	+	+	+	+		+	+	+	+
931203	1.5CCD	3420-7330	1.90			+	+	+			+	+	+	+	+	+				+	+
931204	1.5CCD	3420-7330	1.90		+					+	+	+	+	+	+	+					+

Table 6. Emission line data of Tol 0109–383

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[NeV] 3425.8	931202	3466.1	13.04	-73.3	10.8
[OII] 3727b	801211 900101 911218 921218 931202	3771.9 3771.6 3770.6 3771.8 3771.3	3.67 5.36 5.19 6.01 7.45	-24.8 -29.4 -52.0 -35.3 -36.4	11.1 6.8 9.3 8.0 8.5
[OIII] 3759.9	801211 931202	3803.2 3802.5	0.94 2.17	-6.9 -10.5	8.5 10.6
[NeIII] 3869.7	800825 801211 811223 900101 911218 921218 931202	3917.9 3914.0 3919.9 3913.4 3911.7 3913.3 3913.3	4.13 3.23 1.89 3.92 3.56 5.12 5.87	-38.9 -24.3 -22.1 -20.2 -23.0 -30.3 -29.5	14.4 10.8 11.5 7.4 9.1 9.1 9.3
HeI, H ζ 3889	801211 931202	3938.3 3936.0	1.05 1.55	-8.4 -7.9	9.9 9.4
[NeIII], H ϵ 3969	800825 801211 811223 921218 931202	4016.0 4015.4 4018.5 4016.8 4013.8	1.38 1.56 0.77 1.46 1.90	-13.1 -12.6 -9.8 -8.4 -10.1	15.1 12.0 11.2 7.4 9.8
[SII] 4072b	801211	4118.1	0.47	-3.5	9.1
H δ 4101.7	800825 801211 811223 921218 931202	4151.2 4149.5 4150.7 4149.2 4150.6	1.26 1.27 0.88 2.24 1.94	-9.8 -9.7 -9.0 -10.8 -9.1	15.9 12.5 13.0 16.2 13.4
H γ 4340.5	800825 800826 801211 801211 811223 900101 911218 921218 931202	4400.1 4399.4 4399.8 4416.0 4396.9 4399.2 4401.2 4390.3 4415.0 4399.9	5.88 5.69 6.00 1.15 4.49 5.91 5.56 2.95 2.38 5.22	-44.2 -30.2 -47.2 -6.7 -41.3 -37.2 -27.6 -14.1 -12.0 -25.4	40.6 36.9 12.1 11.0 12.9 13.2
HeII 4685.7	800825 800826 801211 811223 900101 921218 931202	4742.8 4739.9 4740.3 4740.3 4740.3 4739.4 4740.2	2.30 2.14 2.17 1.85 2.41 2.86 2.54	-12.4 -9.2 -12.7 -11.6 -12.1 -13.2 -11.1	16.2 15.4 13.2 11.8 12.5 17.7 13.8
H β 4861.3	800825 800826 801211 801212 811223 900101 911218 921218 931202	4920.3 4917.9 4919.9 4917.9 4917.2 4918.0 4917.2 4918.1 4917.4	7.81 10.52 7.59 8.46 6.30 6.80 6.99 6.68 7.12	-31.8 -35.5 -36.9 -39.1 -33.9 -33.0 -24.1 -26.6 -31.2	17.1 17.2 13.7 15.7 14.2 12.9 12.2 12.8 13.3
[OIII] 4959	791218 800825 800826 801211 801212 811223 900101 911218 921218 931202	5016.9 5017.9 5014.8 5016.9 5016.2 5016.4 5016.0 5015.3 5015.8 5015.0	11.67 11.83 12.30 11.49 12.18 11.83 12.89 12.21 12.99 13.82	-46.3 -44.2 -34.1 -49.7 -50.0 -61.4 -61.8 -40.6 -51.8 -62.2	14.2 16.0 14.6 13.1 14.2 13.6 11.8 12.2 12.8 12.8
[OIII] 5007	791218 800825 800826 801211 801212 811223 900101 911218 921218 931202	5066.1 5064.9 5062.8 5065.4 5065.4 5065.1 5064.4 5063.7 5064.3 5063.8	38.05 38.83 38.11 38.70 38.21 38.91 38.04 37.74 38.66 38.42	-149.8 -143.8 -107.0 -171.1 -157.4 -201.1 -186.2 -131.6 -161.1 -171.5	14.1 15.2 14.7 13.3 14.0 13.8 11.8 11.5 12.4 12.5

Table 6. Emission line data of Tol 0109–383 (continued)

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[FeII], [FeVII] 5158.3	791218	5220.2	0.88	-5.5	36.9
[NI] 5198.5	801212	5260.0	0.27	-1.5	7.9
[FeXIV] 5303.6	791218 800825 800826 801211 801212 811223 921218 931202	5363.7 5309.7 5364.1 5367.7 5369.5 5369.6 5369.6 5367.5	1.56 0.97 1.04 0.60 0.71 1.84 0.69 1.18	-9.2 -4.0 -4.5 -3.7 -3.6 -11.2 -2.8 -5.2	50.5 19.8 17.6 14.9 12.6 39.6 14.2 25.8
[FeVII] 5720.9	791218 800825 800826 801211 801212 811223 911218 921218 931202	5787.3 5790.1 5789.8 5787.6 5786.5 5789.7 5787.4 5787.4 5787.8	1.21 1.27 0.59 1.00 1.23 1.07 0.94 1.10 1.18	-6.8 -5.5 -2.2 -5.6 -6.4 -5.5 -2.9 -4.3 -5.1	14.7 13.9 12.6 14.5 13.5 14.0 9.3 10.8 10.6
HeI 5875.6	791218 800825 800826 801212 911224 911218 921218 931202	5941.9 5945.5 5939.4 5943.6 5943.1 5943.7 5943.5 5943.0	1.08 1.34 1.53 1.01 0.74 1.08 0.97 0.99	-6.6 -5.6 -7.0 -5.2 -4.7 -3.6 -4.0 -4.5	18.8 17.8 24.4 17.8 13.4 16.6 16.6 17.1
[FeVII], CaV 6085.3	791218 800825 800826 801212 811224 911218 921218 931202	6157.3 6156.5 6156.0 6156.6 6157.3 6154.3 6155.3 6156.2	2.48 3.60 2.08 2.71 2.09 2.53 2.77 2.53	-13.1 -15.1 -8.4 -13.2 -12.4 -7.6 -10.9 -10.8	16.9 26.0 19.7 17.6 15.1 17.4 17.4 15.3
[OI] 6300.2	791218 800825 800826 801212 811224 911218 921218 931202	6374.5 6377.6 6373.3 6375.1 6376.2 6374.6 6374.1 6374.6	1.59 2.68 1.78 1.70 1.88 2.18 1.78 1.80	-8.7 -10.7 -7.2 -8.0 -11.6 -6.8 -7.1 -7.9	16.6 20.6 15.9 16.8 19.8 14.2 14.5 15.1
[OI] 6363.9	791218 800825 800826 801212 811224 911218 921218 931202	6447.6 6448.8 6447.1 6446.4 6448.4 6445.6 6448.2 6445.9	2.70 4.17 3.37 2.33 2.74 2.27 1.86 2.75	-14.7 -16.2 -13.5 -9.7 -15.7 -6.8 -7.3 -12.0	22.4 21.7 22.0 15.3 18.7 22.7 15.2 20.9
H α 6562.8	791218 800825 800826 801212 811224 911218 921218 931202	6641.9 6644.0 6641.5 6641.8 6642.2 6640.7 6641.8 6641.6	62.08 100.10 96.57 77.66 62.48 72.94 59.47 55.74	-240.4 -315.7 -269.8 -308.4 -317.6 -194.5 -221.3 -220.3	31.0 33.6 32.2 30.8 31.7 14.0
[SII] 6717.0, 6731.3	791218 791218 791218 800825 800826 801212 811224 911218 921218 931202	6803.9 6797.2 6812.3 6806.1 6802.5 6803.9 6804.3 6804.2 6803.8 6803.0	4.65 0.73 1.06 6.98 5.28 5.00 4.72 6.23 5.00 4.77	-24.4 -2.5 -4.0 -23.7 -18.4 -23.8 -26.9 -18.5 -20.9 -22.0	7.1 8.6 25.8 26.7 25.6

Table 7. Emission line data of MKN 573

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[NeV] 3425.8	921218	3483.4	5.32	-19.3	
[OII] 3727b	801211 891230 921218 931203	3791.2 3791.1 3790.8 3790.9	12.24 15.15 18.97 15.00	-76.2 -142.9 -132.6 -90.6	10.2 7.9 7.7 7.4
[NeIII] 3869.7	801211 811223 811223 891230 921218 931203	3937.8 3941.1 3962.4 3937.6 3935.0 3935.0	6.20 3.60 0.58 8.49 7.32 6.02	-51.8 -33.2 -5.2 -69.3 -54.3 -43.1	9.7 9.7 9.7 6.6 6.0
H ϵ , [NeIII] 3969	801211 811223 921218 931203	4036.7 4039.9 4036.5 4036.9	1.72 0.94 2.33 2.14	-12.3 -7.0 -14.5 -14.1	7.9 7.5
[SII] 4072b	801211 811223	4157.4 4160.7	2.56 2.14	-15.6 -13.8	
H γ 4340.5	800826 801211 811223 891230 921218 931203	4418.2 4420.7 4419.5 4418.2 4421.0 4420.4	4.23 4.52 4.57 5.33 6.17 5.49	-19.0 -23.7 -25.6 -25.9 -30.7 -24.6	9.3
NIII 4514	800826	4584.6	0.59	-2.0	
HeII 4541	891230	4619.3	4.78	-1.8	
HeII 4685.7	800826 801211 811223 881227 891230 921218 931203	4767.7 4765.4 4766.1 4767.4 4766.2 4766.2 4765.8	1.98 2.01 1.71 1.99 1.97 2.13 2.19	-6.2 -7.7 -6.9 -7.1 -7.1 -7.6 -7.4	11.3 8.8 7.0 7.1 7.3 6.7
H β 4861.3	800826 801211 811223 881227 891230 921218 931203	4945.3 4945.5 4945.1 4945.8 4944.7 4944.8 4944.5	5.67 5.68 5.65 6.92 6.01 6.40 6.59	-12.8 -19.5 -22.0 -23.4 -20.2 -22.5 -22.5	9.0 6.4 7.5 6.9
[OIII] 4959	800826 801211 811223 881227 891230 921218 931203	5044.4 5044.8 5045.0 5045.3 5044.1 5044.2 5043.8	19.96 25.04 21.34 23.41 26.15 26.16 25.95	-31.0 -68.8 -70.5 -62.3 -100.4 -91.0 -82.9	8.8 6.4 8.1 7.1 6.9
[OIII] 5007	800826 801211 811223 881227 891230 921218 931203	5091.8 5093.3 5094.3 5094.0 5092.9 5092.9 5092.6	77.85 78.88 77.86 74.71 77.89 78.45 77.52	-121.4 -216.3 -256.3 -212.6 -282.9 -287.6 -262.8	9.6 6.5 7.9 7.1 6.9
[FeXIV] 5303.6	931203	5396.9	0.72	-2.3	11.6
[FeVII] 5720.9	800826 801212 811224 921218	5822.1 5817.7 5820.8 5821.4	1.48 0.64 0.82 1.10	-3.2 -2.1 -2.9 -3.7	8.3
HeI 5875.6	801212 811224 921218 931203	5976.7 5976.7 5975.4 5976.2	0.86 0.73 0.90 0.82	-2.8 -2.6 -3.1 -2.6	8.6
[FeVII], CaV 6085.3	800826 801212 811224 891231 921218	6186.3 6191.7 6193.0 6188.9 6192.4	2.97 1.18 1.07 6.77 1.21	-6.2 -3.4 -3.5 -2.6 -3.9	8.9 9.1 7.8 7.5
[OI] 6300.2	800826 801212 811224 881225 921218 931203	6410.8 6407.9 6410.4 6408.5 6409.8 6408.8	3.02 3.83 2.55 3.84 2.46 2.67	-0.3 -11.4 -8.5 -10.5 -8.6 -8.6	13.8 14.6 11.7 7.4 8.0
[OI] 6363.9	801212 811224 921218 931203	6476.7 6478.1 6478.5 6478.7	1.58 0.94 1.08 1.12	-4.6 -3.1 -3.8 -3.7	17.4 17.6 18.1

Table 7. Emission line data of MKN 573 (continued)

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
H α 6562.8	800826 801212 811224 881225 921218 931203	6683.5 6683.6 6684.4 6683.8 6683.5 6682.6	97.06 57.96 59.38 61.91 47.03 51.14	-150.6 -144.8 -188.9 -154.2 -161.0 -163.8	
[SII] 6717, 6731.3	800826 801212 811224 881225 921218 931203	6839.6 6841.0 6842.0 6839.7 6840.5 6838.9	25.66 16.11 14.10 15.34 11.35 13.18	-47.5 -47.4 -47.8 -42.8 -42.0 -45.1	

Table 8. Emission line data of MKN 590

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[OII] 3727b	801211	3827.2	1.89	-2.2	
HeI, H ζ 3889	801211 811223 891229 900101	3985.6 3987.7 3986.2 3981.0	3.22 3.28 8.40 6.42	-4.4 -3.3 -11.5 -8.3	
[NeIII], H ϵ 3969	900101	4072.9	3.97	-5.8	
H δ 4101.7	800825 801211 811223 821217 861125 891229 900101 901213 901214 911217	4215.1 4211.4 4209.1 4215.8 4211.4 4206.9 4207.3 4213.0 4210.9 4203.5	6.96 5.38 10.45 9.29 4.93 13.09 11.16 8.62 9.42 6.22	-9.7 -8.8 -12.2 -12.2 -6.1 -21.0 -17.6 -12.9 -15.2 -12.3	
H γ 4340.5	800825 800826 801211 811223 821217 831208 841225 851214 861125 891229 900101 901213 901214 901215 911217 921217 931203	4462.2 4461.9 4460.8 4460.8 4468.7 4462.6 4463.0 4463.4 4466.0 4459.5 4457.6 4461.8 4460.5 4462.0 4462.1 4459.7 4462.8	14.90 12.88 14.01 20.78 10.75 6.64 5.70 4.16 10.80 15.04 18.68 14.33 14.65 21.38 17.15 9.50 10.15	-18.6 -14.2 -22.6 -25.7 -14.0 -15.1 -17.5 -9.1 -13.4 -23.9 -30.7 -22.4 -24.5 -33.0 -36.2 -30.1 -23.4	
FeI 4570	891229 900101 901213 901214 901215 911217 921217 931203	4715.0 4730.3 4740.7 4729.3 4718.4 4696.4 4703.8 4707.8	21.56 19.59 18.85 25.16 22.29 25.65 11.68 16.17	-36.4 -33.8 -30.8 -44.0 -34.2 -59.3 -36.9 -37.5	
NIII 4636b	800825	4761.3	13.42	-15.4	
HeII 4685.7	811223	4802.4	15.55	-19.0	
H β 4861.3	800825 800826 801211 811223 821217 831208 841225 851214 861125 880117 880118 891229 900101 901213	4993.3 4991.0 4989.7 4993.9 4998.8 4990.5 4984.3 5000.0 4993.6 4993.4 4991.0 4987.8 4987.0 4991.6	32.63 51.23 31.82 34.27 21.32 12.73 10.30 6.89 24.05 17.52 23.63 37.77 39.99 29.82	-33.1 -45.6 -45.9 -39.6 -25.7 -25.0 -24.4 -12.1 -27.2 -21.5 -26.4 -60.0 -64.6 -45.4	48.5 53.7

Table 8. Emission line data of MKN 590 (continued)

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
H β 4861.3	901214	4990.9	26.75	-41.4	
	901215	4990.5	30.99	-44.1	
	911217	4992.1	30.87	-63.7	
	921217	4993.1	13.75	-34.5	
	931203	4990.7	14.44	-27.8	
[OIII] 4959	800825	5088.2	2.52	-2.7	12.7
	800826	5085.1	3.42	-3.2	15.2
	801211	5090.2	3.14	-4.7	14.3
	811223	5090.5	2.55	-3.0	10.6
	821217	5091.3	2.81	-3.4	18.1
	831208	5089.1	2.56	-4.8	10.5
	841225	5090.6	3.46	-7.7	12.8
	851214	5088.4	2.38	-4.2	11.6
	861125	5088.8	2.37	-2.7	9.7
	880117	5090.8	2.54	-3.3	13.3
	880118	5089.0	2.49	-2.9	11.6
	891229	5088.8	2.08	-3.3	9.0
	900101	5089.1	2.50	-4.0	9.3
	901213	5090.2	2.44	-3.9	9.8
	901214	5089.1	2.41	-4.0	9.1
	901215	5089.0	2.51	-3.7	11.4
	911217	5087.5	3.36	-7.0	
	921217	5088.6	2.31	-6.1	8.2
	931203	5088.9	2.71	-5.5	7.8
[OIII] 5007	800825	5137.3	9.62	-10.8	
	800826	5137.2	12.00	-11.9	18.6
	801211	5138.1	9.34	-14.8	11.3
	811223	5139.3	7.87	-9.8	11.2
	821217	5142.8	7.22	-9.2	10.9
	831208	5139.2	8.94	-17.2	10.9
	841225	5139.2	8.12	-18.5	10.2
	851214	5138.3	7.52	-14.2	12.0
	861125	5138.9	8.35	-10.2	11.7
	880117	5140.0	6.49	-8.8	8.9
	880118	5139.5	7.84	-9.2	9.2
	891229	5138.0	8.02	-13.4	10.0
	900101	5138.1	8.33	-14.0	9.1
	901213	5139.9	8.38	-14.0	9.8
	901214	5139.1	7.80	-13.5	9.2
	901215	5139.3	9.04	-13.9	11.0
	911217	5140.2	9.40	-20.9	8.9
	921217	5138.1	7.63	-21.1	9.1
	931203	5138.1	7.59	-16.4	8.1
HeI 5875.6	800825	6007.6	26.29	-31.1	
	891231	6019.4	8.50	-17.3	
	800826	6032.3	16.44	-17.4	
	811224	6038.5	11.98	-17.7	
	901215	6028.8	8.26	-15.0	
H α 6562.8	800825	6742.9	237.80	-235.6	
	800826	6741.0	308.40	-277.8	
	811224	6744.7	195.80	-295.5	
	831209	6741.8	71.30	-143.6	
	851216	6745.4	72.53	-116.6	
	880117	6739.8	96.28	-125.8	
	880118	6738.8	128.60	-128.0	
	881225	6738.4	33.76	-91.0	
	881226	6737.8	190.20	-153.4	
	891231	6736.5	139.40	-245.0	
	901215	6738.3	141.60	-240.5	
	911217	6741.4	113.50	-237.5	
	921217	6742.6	94.75	-259.2	
	931203	6740.8	86.79	-183.4	

Table 9. Emission line data of NGC 1068

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[NeV] 3425.8	921219	3435.3	159.50	-49.3	14.0
[OII] 3727b	891230	3739.8	151.00	-57.4	10.0
	911218	3738.9	147.20	-54.4	16.9
	921219	3738.5	174.80	-48.2	15.8
	931203	3740.1	192.80	-39.1	
[NeIII] 3869.7	800825	3882.4	131.30	-66.6	25.0
	801211	3881.1	94.00	-67.9	21.6
	881228	3881.4	124.50	-26.8	18.0
	891230	3881.0	170.70	-68.7	
	901214	3880.5	154.10	-57.7	19.9
	911218	3880.4	167.00	-62.4	19.8
	921219	3881.2	212.20	-63.0	20.2
	931203	3882.6	186.70	-37.0	

Table 9. Emission line data of NGC 1068 (continued)

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[NeIII], He 3969	800825	3978.6	36.36	-17.2	
	801211	3979.4	23.45	-13.4	21.7
	811223	3982.9	43.94	-20.7	
	891230	3978.0	45.72	-17.0	
	901214	3978.2	40.00	-13.2	16.8
	911218	3977.4	45.87	-16.0	17.9
	921219	3978.1	48.46	-13.1	18.4
[SII] 4072b	800825	4097.1	51.23	-22.9	
	801211	4098.6	33.48	-17.2	
	811223	4097.7	47.82	-19.2	
	891230	4097.2	49.20	-16.4	
	901214	4097.5	47.33	-14.3	
	911218	4095.2	49.20	-15.6	
H γ 4340.5	800825	4350.9	78.12	-30.6	
	801211	4362.0	69.45	-30.7	
	811223	4350.0	81.92	-30.1	
	881228	4363.2	95.00	-15.5	
	891230	4350.8	81.09	-26.8	
	901214	4361.2	94.05	-28.5	
	911218	4350.6	82.66	-26.2	
	921219	4350.9	94.77	-25.2	
	931203	4360.5	87.80	-13.9	
HeII 4685.7	800825	4698.3	37.37	-10.4	
	801211	4698.1	32.70	-9.9	
	811223	4696.3	40.21	-11.4	
	881228	4701.2	31.60	-4.1	
	891230	4697.9	39.00	-10.4	
	901214	4699.4	38.25	-9.0	
	911218	4698.9	34.29	-8.7	16.8
	921219	4699.0	32.15	-7.0	
	931203	4700.5	38.25	-5.2	
H β 4861.3	800825	4875.6	122.10	-28.3	
	801211	4878.6	99.20	-27.0	
	811223	4875.2	114.50	-29.3	
	881228	4877.2	91.02	-11.2	
	891230	4876.7	110.40	-28.9	
	901214	4876.7	102.90	-23.5	
	901215	4876.7	119.00	-27.2	
	911218	4876.5	104.30	-26.4	
	921219	4876.1	106.50	-24.3	
	931203	4877.9	111.20	-15.6	
[OIII] 4959	800825	4971.4	322.00	-31.2	
[OIII] 5007	800825	5011.4	2215.00	-474.0	
	801211	5012.9	2152.00	-555.5	
	811223	5011.2	2126.00	-585.0	
	881228	5014.3	1965.00	-257.3	
	891230	5012.9	1977.00	-553.1	
	901214	5013.5	1976.00	-474.9	
	901215	5013.1	1994.00	-505.5	
	911218	5013.4	1959.00	-520.9	
	921219	5013.4	1965.00	-454.3	
	931203	5013.7	2004.00	-298.6	
[NII] 5754.8	801212	5752.6	19.02	-6.5	
HeI 5875.6	800825	5892.5	19.90	-4.6	
	911218	5895.3	11.09	-2.7	
[FeVII], CaV 6085.3	800825	6098.7	52.59	-12.3	
	801212	6102.0	34.69	-11.5	
	811224	6102.9	40.02	-8.9	
	891231	6103.0	28.96	-7.7	
	911218	6105.6	29.25	-7.0	
	921219	6104.0	46.23	-11.0	
	931203	6100.0	38.56	-5.7	
[OI] 6300.2	800825	6319.0	89.46	-20.2	
	801212	6321.2	63.38	-21.0	
	811224	6321.9	65.76	-14.1	
	891231	6321.1	59.53	-15.3	
	901215	6318.8	52.10	-11.9	
	911218	6321.7	61.08	-14.4	
	921219	6322.1	51.29	-12.0	19.6
	931203	6321.5	52.37	-8.0	
[OI] 6363.9	800825	6386.7	22.46	-4.9	
	801212	6390.4	27.44	-8.8	
	811224	6388.0	22.37	-4.8	
	891231	6387.1	19.55	-5.0	
	911218	6388.9	24.42	-5.7	
	921219	6389.2	20.96	-4.9	
	931203	6388.3	19.00	-2.9	24.6

Table 9. Emission line data of NGC 1068 (continued)

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
H α 6562.8	800825	6591.9	2123.00	-420.6	
	801212	6593.4	1537.00	-454.5	
	811224	6594.5	1972.00	-407.6	
	891231	6593.4	1619.00	-391.8	
	901215	6592.4	1575.00	-357.2	
	911218	6593.7	1634.00	-379.4	
	921219	6594.2	1371.00	-342.1	
	931203	6594.1	1543.00	-244.2	
[SII] 6717.0, 6731.3	800825	6745.9	184.10	-37.3	
	801212	6748.8	135.90	-39.2	
	811224	6749.7	201.50	-41.2	
	891231	6748.4	139.10	-33.5	
	901215	6747.5	140.40	-30.9	
	911218	6747.8	153.40	-35.1	
	921219	6748.9	135.00	-32.3	
	931203	6748.8	156.80	-24.8	

Table 10. Emission line data of MKN 609

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[OIII] 3727b	801211	3853.8	1.60	-6.2	10.4
[NeIII] 3869.7	800825	4000.6	1.14	-5.9	
	801211	4000.1	1.98	-8.0	17.9
H γ 4340.5	800825	4495.6	1.29	-5.0	
	891229	4513.0	0.95	-2.1	
NIII 4514	800825	4656.6	1.80	-6.8	
HeII 4685.7	800825	4846.0	2.75	-9.9	
H β 4861.3	800825	5027.2	3.22	-10.8	11.3
	800826	5014.8	3.82	-12.0	
	800826	5027.3	0.85	-2.5	8.2
	801211	5018.3	7.62	-24.3	
	801211	5029.1	1.10	-3.1	6.4
	811223	5028.0	0.89	-2.3	6.5
	811223	5020.5	8.36	-26.4	
	821217	5015.3	5.71	-16.1	
	821217	5030.8	1.20	-3.3	6.6
	831208	5028.3	1.49	-3.6	5.2
	831208	5009.0	9.77	-27.8	
	841225	5028.5	1.64	-4.0	6.8
	851213	5028.3	1.35	-3.2	5.7
	851215	5013.1	6.62	-16.8	
	851216	5023.4	9.67	-31.1	
	851216	5028.8	1.84	-5.1	9.0
	880118	5012.4	9.16	-23.4	
	880118	5029.5	2.17	-5.0	5.9
	891229	5017.5	7.93	-20.4	
	891229	5028.1	1.65	-3.7	5.3
	901213	5018.1	6.48	-18.8	
	901213	5029.5	1.02	-4.3	5.3
	901215	5014.9	8.94	-27.4	
	901215	5027.4	1.27	-3.6	
	911217	5021.5	4.58	-14.7	
	911217	5028.9	1.61	-4.9	4.2
	921217	5021.3	4.12	-13.0	
	921217	5028.3	1.50	-4.6	3.8
	931202	5020.0	5.32	-16.2	
	931202	5028.0	1.68	-4.8	
[OIII] 4959	800825	5125.4	3.04	-9.3	14.7
	800826	5124.7	3.22	-9.5	13.3
	801211	5126.3	3.56	-10.6	12.3
	811223	5127.2	3.34	-9.7	11.8
	821217	5131.4	3.60	-9.5	15.8
	831208	5129.0	3.56	-9.3	15.1
	841225	5126.9	3.67	-9.3	13.8
	851213	5127.2	3.64	-8.8	12.9
	851215	5127.1	2.89	-6.6	13.8
	851216	5126.4	2.80	-8.5	15.8
	880118	5127.9	3.59	-8.6	13.0
	891229	5127.0	3.59	-9.2	12.1
	901213	5127.6	3.13	-8.5	11.6
	901215	5128.5	3.28	-8.9	11.2
	911217	5127.7	2.92	-8.7	10.4
	921217	5126.8	3.59	-11.1	12.9
	931202	5126.2	4.07	-12.3	13.0

Table 10. Emission line data of MKN 609 (continued)

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[OIII] 5007	800825	5174.8	10.11	-31.0	15.2
	800826	5173.9	10.01	-29.1	14.5
	801211	5176.0	9.72	-29.6	11.4
	811223	5177.2	9.96	-31.3	11.2
	821217	5179.8	9.73	-25.9	12.1
	831208	5177.3	9.04	-24.3	12.4
	841225	5176.4	10.24	-26.3	11.5
	851213	5176.4	9.71	-23.3	13.4
	851215	5176.8	8.79	-20.4	12.5
	851216	5178.1	9.27	-29.1	13.4
	880118	5178.1	8.88	-21.3	11.1
	881228	5177.7	7.86	-13.4	9.4
	891229	5176.4	9.67	-25.5	11.2
	901213	5177.9	9.82	-27.7	10.9
[OI] 6300.2	901215	5177.7	8.67	-23.6	11.8
	911217	5177.4	8.66	-26.4	10.1
	921217	5176.4	9.61	-30.3	11.2
	931202	5176.0	10.05	-30.4	10.7
H α 6562.8	800825	6516.7	1.12	-3.5	
	800826	6517.9	0.67	-2.1	11.7
	811224	6517.7	1.10	-3.7	14.1
	851215	6513.8	1.80	-4.7	
	880118	6515.1	1.34	-3.1	
	891231	6514.3	1.72	-5.3	
	911217	6519.2	1.06	-3.6	
	921217	6516.6	0.95	-3.3	
	931202	6515.9	0.72	-2.3	
H α 6562.8	800825	6792.2	46.81	-124.5	
	800826	6789.8	49.66	-140.7	
	801212	6791.6	43.40	-122.7	
	811224	6791.6	52.86	-161.8	
	851215	6794.0	39.32	-95.5	
	851216	6793.6	37.96	-117.3	
	880118	6794.1	48.47	-97.6	
	881225	6795.2	52.49	-94.2	
	891231	6793.3	39.82	-110.7	
	901215	6793.1	26.01	-70.9	
	911217	6794.1	28.05	-91.0	
	921217	6794.7	27.85	-92.2	
	931202	6794.0	31.03	-97.7	
[SII] 6717.0, 6731.3	800825	6955.6	3.98	-10.8	
	800826	6954.1	3.03	-8.7	
	801212	6957.9	3.16	-10.0	
	811224	6957.0	3.69	-13.4	
	851215	6956.6	4.55	-12.2	
	851216	6955.9	4.32	-13.8	
	880118	6955.7	4.45	-9.4	
	881225	6955.5	5.97	-12.2	
	891231	6954.6	3.89	-11.3	
	901215	6949.5	3.94	-12.1	
	911217	6953.8	3.57	-13.1	
	921217	6954.8	3.51	-12.2	
	931202	6953.8	3.73	-12.4	

Table 11. Emission line data of NGC 1566

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[NeIII] 3869.7	811223	3887.1	2.01	-3.1	14.6
H γ 4340.5	811223	4373.4	4.43	-5.4	
	821217	4372.9	5.63	-4.3	
	831208	4372.1	9.01	-9.5	
FeII 4570	811223	4593.5	13.67	-16.6	
	821217	4615.0	29.65	-22.8	
H β 4861.3	811223	4887.3	8.94	-9.3	28.6
	821217	4888.9	11.45	-8.0	27.7
	831208	4886.1	6.02	-6.2	
	841225	4885.2	1.55	-1.8	6.8
	851214	4884.1	1.17	-0.9	4.6
	861125	4885.0	1.30	-1.1	
	880116	4884.9	2.06	-0.7	
	880118	4887.9	5.16	-4.5	
H β 4861.3	881227	4886.2	1.21	-0.8	

Table 11. Emission line data of NGC 1566 (continued)

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
H β 4861.3	891230	4885.5	1.81	-1.5	5.6
	901213	4887.3	1.96	-1.6	5.9
	901214	4887.4	2.54	-1.6	5.1
	901215	4886.9	2.00	-1.6	
	911216	4888.5	4.23	-3.8	
	911218	4888.4	4.86	-4.9	
	921218	4885.0	1.72	-1.4	
	931203	4882.5	1.49	-0.9	
931204	4883.8	2.88	-2.7		
[OIII] 4959	811223	4982.8	6.13	-6.3	7.9
	821217	4983.1	6.35	-4.5	9.8
	831208	4983.3	6.03	-6.4	9.8
	841225	4983.5	5.82	-6.7	7.7
	851214	4982.7	6.33	-4.9	8.4
	861125	4982.8	6.08	-4.9	8.7
	880116	4983.4	6.96	-2.6	9.0
	880118	4984.1	4.74	-4.2	7.6
	881227	4981.6	7.06	-4.7	8.5
	891230	4982.9	6.47	-5.5	7.4
	901213	4984.2	6.23	-5.1	7.7
	901214	4985.4	6.17	-3.7	5.8
	901215	4983.9	6.72	-5.7	10.3
	911216	4983.1	6.89	-6.3	7.3
	911218	4983.4	6.21	-6.3	6.0
	921218	4982.1	7.00	-5.8	7.9
	931203	4982.2	7.81	-4.9	
	931204	4982.5	6.72	-6.5	6.6
[OIII] 5007	811223	5031.8	18.42	-19.4	8.5
	821217	5032.0	18.40	-13.1	8.8
	831208	5031.4	19.45	-20.6	9.0
	841225	5031.9	18.38	-21.6	7.7
	851214	5030.8	18.01	-14.1	7.6
	861125	5031.1	17.94	-14.9	8.5
	880116	5032.4	15.86	-6.0	6.9
	880118	5032.2	17.27	-16.0	7.0
	881227	5030.8	16.52	-11.1	6.2
	891230	5031.4	18.01	-15.9	6.7
	901213	5033.0	17.39	-14.5	7.0
	901214	5033.0	17.63	-10.9	6.4
	901215	5032.1	17.57	-15.4	8.6
	911216	5032.2	17.72	-16.8	6.1
	911218	5032.0	17.94	-18.6	5.9
	921218	5031.1	17.96	-15.4	6.4
	931203	5030.9	18.40	-11.9	5.8
	931204	5030.9	19.27	-19.2	6.3
[OI] 6300.2	811224	6332.8	1.70	-2.1	9.9
	880118	6333.2	2.78	-1.9	8.9
	881226	6332.6	1.70	-1.1	
	891231	6332.0	2.44	-2.1	
	901215	6329.5	2.33	-1.8	
	911216	6333.2	2.20	-1.9	
	911218	6333.1	2.52	-2.1	7.6
	921218	6332.6	2.73	-2.1	
	931203	6331.3	2.19	-1.4	
	931204	6331.6	2.64	-2.5	
[NII] 6548.2	841227	6580.0	1.39	-1.0	5.3
	841227	6594.5	6.61	-4.7	6.8
H α 6562.8	811224	6602.3	51.30	-57.1	
	841227	6603.2	36.60	-35.5	
	851216	6603.1	49.32	-34.4	
	880117	6601.3	53.31	-20.5	
	880118	6600.7	55.11	-33.8	
	881226	6603.3	43.03	-25.6	
	891231	6603.6	40.69	-32.0	
	901215	6603.2	44.43	-31.5	
	911216	6604.7	47.78	-39.8	
	911218	6603.9	62.20	-49.2	
	921218	6604.0	39.52	-29.9	
	931203	6603.2	34.23	-21.6	
	931204	6603.0	46.69	-43.2	
[NII] 6583.6	841227	6615.5	9.76	-7.5	7.8
[SII] 6717.0, 6731.3	811224	6757.8	4.45	-5.3	
	841227	6757.0	5.53	-5.3	
	851216	6758.3	8.92	-6.9	
	880117	6758.4	6.68	-2.8	
	880118	6757.4	0.55	-4.3	
	881226	6758.1	7.68	-5.1	
	891231	6757.9	5.85	-4.8	
	901215	6755.6	9.15	-6.9	
	911216	6758.0	7.90	-7.1	
	911218	6757.2	8.99	-7.5	
	921218	6756.8	7.50	-6.1	
	931203	6754.9	7.76	-5.3	
	931204	6757.2	7.19	-7.0	

Table 12. Emission line data of 3C 120

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[O II] 3727b	841225	3848.7	4.74	-9.0	
	921217	3849.4	2.08	-3.0	
	921219	3849.6	1.92	-2.5	
	931202	3848.0	3.21	-4.2	
[NeIII] 3869.7	801211	4005.9	5.85	-19.5	
	811223	4008.7	5.58	-13.9	
	841225	4002.8	4.03	-9.4	
	861125	3997.7	2.41	-5.8	
	891229	4004.0	6.39	-14.8	
	900101	4004.4	6.37	-15.6	
	921217	4006.7	5.56	-9.2	
	921219	4004.9	4.86	-7.6	
	931202	4005.1	5.06	-7.7	
	931204	4007.2	6.72	-9.2	
[NeIII], H ϵ 3969	801211	4106.1	4.45	-15.8	
	811223	4099.5	2.80	-7.4	
	821217	4103.9	3.48	-9.9	
	831207	4093.6	3.78	-5.5	
	841225	4099.1	2.52	-7.5	
	851213	4096.4	3.39	-10.0	
	921219	4100.0	3.87	-6.9	
	861125	4102.0	1.36	-3.7	
	891229	4102.6	2.49	-6.5	
	900101	4099.1	3.97	-10.7	
	931202	4099.2	5.82	-9.8	
	921217	4102.2	3.50	-6.5	
	931202	4099.2	5.82	-9.8	
	931204	4103.3	5.32	-8.0	
H δ 4101.7	801211	4236.6	5.85	-22.0	
	801211	4236.2	5.72	-21.4	45.5
	811223	4235.3	6.07	-17.0	42.8
	821217	4237.2	9.53	-29.7	
	831207	4232.3	8.79	-13.8	
	841225	4234.5	4.20	-14.3	
	851213	4233.2	4.45	-14.0	
	861125	4237.2	3.58	-10.2	
	891229	4234.9	5.20	-14.5	
	900101	4236.1	6.44	-19.5	
	901214	4239.1	5.95	-16.2	
	911216	4236.1	3.58	-17.5	
	921217	4240.9	6.48	-13.1	
	921219	4240.9	6.99	-13.9	
	931202	4238.7	8.59	-15.4	
	931204	4240.6	10.35	-16.9	
H γ 4340.5	801211	4489.4	10.60	-37.6	43.2
	811223	4484.8	12.60	-35.6	48.0
	821217	4485.3	14.03	-43.7	
	831207	4488.7	18.88	-30.6	
	841225	4489.0	11.95	-41.9	
	851213	4486.5	9.02	-26.7	
	861125	4493.0	11.93	-38.8	
	861126	4490.5	7.96	-29.0	
	881227	4484.9	7.62	-29.1	
	881228	4490.7	7.38	-31.3	
	891229	4486.8	13.92	-44.1	
	900101	4488.9	15.08	-50.1	
	901214	4491.1	14.15	-42.4	
	901216	4487.6	16.36	-53.2	
	911216	4491.8	8.78	-43.8	
	911217	4490.1	8.34	-41.3	
	921217	4490.4	15.99	-34.5	
	921219	4490.9	17.81	-39.0	
	931202	4487.9	20.55	-39.3	
	931204	4489.2	22.87	-40.0	
HeII 4685.7	801211	4841.6	1.46	-4.7	21.5
	801211	4833.4	5.26	-18.6	
	811223	4833.8	6.66	-18.6	
	811223	4837.8	1.48	-3.7	17.1
	821217	4838.3	4.28	-12.9	
	831207	4829.6	12.65	-21.0	
	841225	4839.0	7.66	-27.3	
	851213	4841.9	3.14	-9.4	
	861125	4836.6	3.70	-11.4	
	900101	4829.2	3.84	-12.9	
	901214	4830.0	8.37	-25.0	
	901216	4834.1	7.10	-21.8	
	921217	4838.1	6.49	-13.6	
	921219	4830.8	6.17	-13.1	
	931202	4838.4	12.05	-22.0	
	931204	4832.3	10.30	-17.6	

Table 12. Emission line data of 3C 120 (continued)

Line λ_{rest} Å	Date yyymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
H β 4861.3	801211	5021.6	22.80	-65.7	37.9
	811223	5018.9	27.10	-66.1	
	821217	5021.7	22.78	-55.6	
	831207	5021.7	31.51	-45.9	
	841225	5023.1	18.57	-53.3	
	851213	5021.0	17.64	-43.1	
	861125	5022.3	17.17	-42.9	
	861126	5021.1	13.49	-40.4	
	880117	5025.3	19.74	-57.8	
	881227	5022.1	15.77	-48.7	
	881228	5020.2	14.51	-50.3	
	891229	5021.6	24.09	-65.1	
	900101	5020.9	23.72	-64.0	
	901214	5023.0	22.10	-50.7	
	901216	5023.4	24.49	-62.6	
	911216	5022.4	14.18	-51.3	
	911217	5022.5	14.62	-57.7	
	921217	5023.2	27.87	-51.0	
	921219	5023.5	29.88	-56.9	
	931202	5023.2	38.36	-61.2	
	931204	5022.9	39.71	-62.8	
[OIII] 4959	801211	5122.1	8.16	-23.4	8.4
	811223	5121.9	6.57	-15.8	
	821217	5124.4	6.91	-16.8	
	831207	5123.0	7.73	-11.8	
	841225	5123.1	7.18	-20.6	
	851213	5121.2	7.84	-21.5	
	861125	5123.5	7.24	-20.4	
	861126	5121.8	6.89	-21.0	
	861126	5122.1	6.55	-20.4	
	880117	5123.6	7.64	-22.2	
	881227	5123.4	7.36	-28.1	
	881228	5122.3	7.42	-28.2	
	891229	5122.5	7.56	-22.1	
	900101	5122.1	7.71	-23.3	
	901214	5122.4	7.47	-19.7	
	901216	5122.4	7.61	-20.7	
	911216	5122.8	7.80	-32.2	
	911217	5121.5	8.29	-38.9	
	921217	5121.9	7.80	-14.8	
	921219	5122.1	7.84	-15.2	
	931202	5121.5	8.51	-14.2	
	931204	5121.5	7.79	-13.0	
[OIII] 5007	801211	5171.0	25.20	-77.2	8.5
	811223	5172.2	25.30	-66.1	
	821217	5174.1	23.56	-56.8	
	831207	5172.5	24.71	-37.8	
	841225	5172.3	24.65	-72.7	
	851213	5170.8	24.23	-63.7	
	861125	5172.9	24.25	-67.4	
	861126	5171.7	23.65	-65.8	
	880117	5172.9	24.51	-71.3	
	881227	5172.9	24.52	-87.7	
	881228	5171.8	22.39	-77.7	
	891229	5171.9	24.51	-73.2	
	900101	5171.6	24.53	-74.7	
	901214	5171.9	24.77	-65.6	
	901216	5171.8	25.54	-71.7	
	911216	5172.5	25.14	-109.1	
	911217	5171.0	25.22	-111.6	
	921217	5171.4	25.52	-51.4	
	921219	5171.7	25.47	-52.7	
	931202	5171.1	25.94	-42.9	
	931204	5171.0	25.63	-44.1	
FeII 5190	801211	5351.6	3.34	-12.7	
[FeII], [FeIII] 5270	811223	5410.0	3.61	-11.1	
	831207	5430.5	9.90	-18.9	
	901216	5428.1	5.94	-19.7	
	921217	5423.8	7.26	-16.9	
	921219	5445.8	8.97	-21.6	
	931202	5421.0	9.50	-17.7	
	931204	5427.9	7.98	-15.7	

Table 12. Emission line data of 3C 120 (continued)

Line λ_{rest} Å	Date yyymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[FeXIV] 5303.6	911217	5481.8	1.52	-7.6	13.6
HeI 5875.6	801212	6079.7	8.41	-27.0	55.0
	811224	6070.5	8.30	-26.9	
	831209	6068.9	9.25	-20.2	
	841227	6072.6	5.58	-19.1	
	851215	6080.1	3.55	-12.3	
	880117	6068.5	5.08	-14.6	
	891231	6069.1	4.78	-17.9	
	901216	6076.9	7.89	-25.0	
	911216	6075.4	3.35	-15.6	
	911217	6072.8	3.98	-20.3	
	921217	6086.7	10.66	-24.3	
	921219	6085.2	10.81	-25.8	
	931202	6079.8	16.75	-29.3	
	931204	6079.6	12.83	-25.4	
[OI] 6300.2	811224	6509.9	1.15	-3.8	6.5
	841227	6511.7	0.95	-3.3	
	851215	6510.1	1.31	-4.3	
	880117	6510.4	1.05	-3.0	
	891231	6507.6	1.21	-4.7	
	891231	6508.3	1.41	-5.5	
	901216	6508.3	1.26	-4.1	
	911216	6509.5	0.94	-4.3	
	911217	6507.9	1.09	-5.2	
	921217	6509.5	1.09	-2.5	
[OI] 6363.9	921219	6509.4	0.96	-2.3	32.7
	931202	6508.7	1.27	-2.2	
	931204	6509.0	0.87	-1.8	
	811224	6576.4	0.96	-2.9	
	891231	6577.0	0.71	-2.6	
	901216	6571.9	1.34	-4.2	
	911216	6574.6	0.77	-3.3	
H α 6562.8	921217	6572.1	1.78	-4.0	52.0
	921219	6575.9	1.31	-3.1	
	931202	6574.6	2.43	-4.1	
	931204	6574.0	1.94	-3.9	
	801212	6781.3	181.00	-378.3	
	811224	6781.8	150.00	-371.5	
	831209	6780.2	174.80	-330.0	
	841227	6781.6	133.40	-306.5	
	851215	6782.3	120.20	-255.9	
	880117	6781.5	112.20	-226.3	
[SII] 6717.0, 6731.3	881225	6781.9	123.70	-355.4	52.0
	881226	6780.7	107.00	-322.0	
	891231	6782.3	122.80	-309.2	
	901216	6782.3	156.90	-400.0	
	911216	6782.3	122.80	-441.3	
	911217	6780.8	115.70	-429.2	
	921217	6782.8	167.10	-313.6	
	921219	6782.9	164.90	-339.9	
	931202	6782.0	231.20	-332.4	
	931204	6782.6	191.80	-333.6	
	801212	6947.3	1.97	-4.7	
	811224	6946.4	0.32	-7.0	
	831209	6948.7	1.99	-4.2	
[SII] 6717.0, 6731.3	841227	6946.0	2.04	-6.1	52.0
	891231	6947.9	2.09	-7.0	
	901216	6943.7	2.57	-7.4	
	911216	6946.0	2.25	-9.2	
	911217	6943.8	3.22	-14.8	
	921217	6945.9	2.46	-5.0	
	921219	6946.3	2.21	-4.8	
	931202	6945.6	2.62	-4.1	
	931204	6945.4	2.30	-4.5	

Table 13. Emission line data of MKN 618

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[NeIII] 3869.7	801211	4008.1	4.97	-15.4	
	811223	4016.4	5.34	-20.9	
	921218	4008.9	4.98	-9.8	
[NeIII], H ϵ 3969	801211	4112.0	2.04	-6.8	
	811223	4112.2	2.81	-11.9	
	901214	4105.6	3.47	-6.7	
	921218	4107.7	2.72	-6.2	
H δ 4101.7	801211	4249.6	5.49	-21.0	44.3
	811223	4252.6	4.56	-20.6	
	831208	4241.6	6.82	-21.6	
	841226	4251.3	4.43	-15.0	
	851214	4252.9	8.14	-13.4	
	861125	4250.8	12.53	-21.6	
	861126	4252.6	11.14	-22.7	
	880116	4244.3	14.61	-23.4	
	891230	4247.9	12.10	-16.7	
	901213	4244.7	7.70	-16.3	
	901214	4245.2	7.72	-16.7	
	921218	4244.0	7.51	-21.0	
H γ 4340.5	801211	4500.9	10.69	-43.0	52.4
	811223	4499.9	9.85	-45.0	53.8
	831208	4502.4	13.02	-43.7	
	841226	4503.3	12.12	-39.6	
	851214	4503.8	14.73	-25.1	
	861125	4498.4	16.50	-29.3	
	861126	4494.2	18.06	-35.5	
	880116	4496.6	17.20	-27.7	
	891230	4496.8	21.93	-34.6	
	901213	4498.0	14.54	-34.2	46.9
	901214	4495.2	14.94	-35.7	
	901215	4492.5	15.35	-35.4	
	911217	4494.6	13.33	-41.6	
	921218	4495.2	11.31	-34.8	
	931202	4496.6	12.35	-21.3	
FeII 4570	801211	4754.7	11.82	-51.8	
	811223	4779.6	11.41	-55.0	
	831208	4764.0	16.47	-61.0	
	841226	4758.7	18.31	-62.3	
	851214	4781.6	26.25	-48.9	
	861125	4767.5	24.47	-47.9	
	861126	4768.9	25.44	-56.0	
	891230	4754.7	31.90	-58.4	
	901213	4764.8	19.16	-49.8	
	901214	4755.4	18.68	-48.1	
	901215	4761.8	18.23	-46.9	
	911217	4765.1	18.25	-62.8	
	921218	4764.4	15.10	-52.1	
HeII 4685.7	801211	4851.6	0.97	-4.0	18.4
	811223	4844.7	0.66	-2.7	17.2
H β 4861.3	801211	5033.9	16.31	-62.6	40.9
	811223	5035.1	16.58	-68.0	
	831208	5036.1	15.07	-50.9	
	841226	5036.2	15.47	-42.3	
	851214	5036.7	23.29	-39.7	
	861125	5033.4	30.15	-56.2	
	861126	5035.3	29.58	-45.3	
	880116	5034.0	27.13	-46.2	
	881228	5035.6	19.51	-43.2	
	891230	5035.5	24.88	-42.7	
	901213	5033.7	21.03	-49.7	
	901214	5033.5	20.28	-46.5	
	901215	5033.8	21.95	-52.4	37.4
	911217	5033.0	13.26	-37.4	
	921218	5032.9	14.84	-44.4	
	931202	5032.6	22.10	-45.4	

Table 13. Emission line data of MKN 618 (continued)

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[OIII] 4959	801211	5130.2	3.54	-13.2	13.6
	811223	5131.2	4.14	-16.2	13.9
	831208	5130.7	3.46	-11.5	14.0
	841226	5130.5	3.33	-9.7	12.9
	851214	5130.4	3.72	-6.7	14.4
	861125	5131.3	3.66	-7.1	14.3
	861126	5131.8	3.70	-7.6	14.0
	880116	5132.5	4.09	-7.2	12.8
	881228	5128.9	3.79	-9.4	16.0
	891230	5131.0	3.70	-7.0	12.7
	901213	5132.1	3.14	-8.0	13.7
	901214	5131.5	3.62	-9.3	13.6
	901215	5131.3	3.78	-9.6	14.2
	911217	5129.8	3.53	-11.0	12.1
	921218	5129.9	3.86	-12.7	14.0
	931202	5130.4	3.95	-8.3	14.7
[OIII] 5007	801211	5180.0	14.40	-59.1	14.8
	811223	5180.5	12.35	-52.0	13.3
	831208	5181.6	13.85	-50.9	15.3
	841226	5179.9	13.96	-43.7	14.7
	851214	5180.4	13.38	-24.5	15.0
	861125	5180.7	12.58	-23.8	15.2
	861126	5181.1	13.89	-29.3	15.7
	880116	5181.1	13.65	-25.1	14.0
	881228	5180.8	10.33	-25.2	12.6
	891230	5180.8	14.15	-27.6	14.1
	901213	5181.7	12.85	-34.5	14.1
	901214	5180.9	12.28	-31.4	13.3
	901215	5181.7	13.33	-34.8	14.7
	911217	5179.3	12.70	-41.4	13.8
	921218	5180.0	12.74	-42.9	13.6
	931202	5179.9	13.14	-28.9	13.5
FeII 5190	811223	5436.6	7.52	-41.5	
	841226	5433.4	7.82	-29.6	
	901214	5433.2	9.79	-31.5	
[FeII], [FeIII] 5270	801211	5459.6	10.06	-54.1	
	831208	5441.0	7.52	-34.8	
	851214	5467.5	15.39	-34.6	
	861125	5466.7	17.53	-41.1	
	861126	5461.5	19.53	-50.5	
	901213	5448.5	14.87	-51.1	
	901215	5449.9	9.21	-29.5	
	921218	5444.1	9.57	-39.4	
HeI 5875.6	801212	6090.2	5.34	-29.2	
	811224	6086.5	4.70	-23.7	
	851216	6095.6	10.26	-26.5	
	891231	6081.8	7.88	-20.7	
	901215	6082.6	6.14	-20.9	
[FeVII], CaV 6085.3	801212	6298.2	1.76	-10.1	16.0
	921218	6296.1	0.87	-3.8	
[OI] 6300.2	921218	6523.8	0.41	-1.8	
	921218	6591.4	0.60	-2.5	
H α 6562.8	801212	6799.9	71.02	-310.8	
	811224	6800.2	82.24	-351.1	
	831209	6799.5	67.60	-252.5	
	851216	6799.6	100.50	-219.2	
	880118	6798.5	77.38	-103.9	
	881225	6798.7	83.72	-236.0	
	891231	6798.5	97.04	-205.2	
	901215	6798.0	91.70	-277.1	
	911217	6796.1	77.06	-267.0	
	921218	6797.7	75.34	-304.1	
	931202	6796.9	71.53	-176.4	
[SII] 6717.0, 6731.3	801212	6961.3	1.33	-6.6	
	811224	6963.5	1.18	-5.9	
	911217	6957.9	2.44	-10.8	
	921218	6962.7	1.64	-7.3	

Table 14. Emission line data of AKN 120

Line λ_{rest} Å	Date yyymmdd	λ_{obs} Å	Flux 10^{-14} erg s $^{-1}$ cm $^{-2}$	EW Å	FWHM Å
H δ 4101.7	811223	4245.4	15.04	-10.3	
	821217	4243.1	20.88	-20.9	
	841224	4256.2	20.59	-18.2	
	841226	4247.8	17.54	-11.8	
	851214	4239.3	12.62	-11.0	
	861125	4250.9	26.27	-24.8	
	891229	4240.9	20.25	-15.8	
	891230	4239.3	20.23	-13.4	
	900101	4240.1	20.20	-12.4	
	901213	4236.3	19.29	-15.6	
	901214	4237.4	18.64	-16.0	
	921217	4234.9	10.68	-9.6	
	921219	4230.4	10.61	-9.5	
	931204	4236.1	9.95	-9.8	
H γ 4340.5	811223	4486.0	39.13	-27.1	
	821217	4484.3	42.29	-48.6	
	831207	4489.3	39.83	-32.0	
	831208	4496.3	35.26	-19.7	
	841224	4483.6	51.78	-48.1	
	841226	4488.6	52.50	-34.5	
	851214	4492.4	45.76	-39.7	
	861125	4490.0	32.75	-31.5	
	861126	4486.5	43.16	-37.4	
	880116	4487.0	29.56	-24.4	
	881227	4489.1	44.12	-34.3	
	881228	4495.1	44.56	-33.5	
	891229	4485.3	49.35	-38.3	
	891230	4486.3	53.58	-37.6	
	900101	4486.3	56.28	-38.0	
	901213	4484.9	48.42	-40.8	
	901214	4485.6	41.15	-36.5	
	901215	4480.3	46.91	-42.3	
	911216	4480.2	28.55	-26.4	
	911217	4479.1	26.58	-28.4	
	911218	4479.2	27.62	-28.2	
	921217	4481.6	38.99	-38.1	
	921219	4480.2	35.23	-33.6	
	931202	4472.2	36.97	-40.0	
	931203	4485.9	35.80	-30.2	
	931204	4482.6	33.63	-34.8	
FeII 4570	811223	4724.5	37.31	-27.2	
	821217	4729.2	45.33	-56.9	
	831207	4727.0	52.28	-45.1	
	831208	4725.9	61.34	-40.2	
	841224	4733.6	56.84	-58.5	
	841226	4733.5	63.27	-43.4	
	851214	4721.5	51.14	-45.4	
	861125	4731.0	44.22	-47.5	
	861126	4719.3	61.92	-56.5	
	880116	4724.7	35.51	-32.3	
	880117	4723.1	44.81	-43.0	
	880118	4716.8	53.43	-53.0	
	880118	4714.1	52.35	-51.7	
	881227	4725.8	50.72	-42.2	
	881228	4731.1	60.22	-49.0	
	891229	4717.1	50.33	-39.7	
	891230	4726.6	41.03	-30.2	
	900101	4723.0	50.29	-36.8	
	901213	4723.2	51.51	-45.9	
	901214	4727.9	48.64	-46.7	
	901215	4717.9	50.78	-46.9	
	911216	4711.0	38.07	-37.8	
	911217	4708.5	41.88	-48.5	
	911218	4714.4	34.84	-38.8	
	921217	4720.1	41.34	-43.9	
	921219	4720.3	44.89	-47.5	
	931202	4706.1	44.00	-52.7	
	931203	4727.6	49.19	-46.6	
	931204	4719.4	38.17	-43.1	
H β 4861.3	801212	5056.3	123.20	-107.4	
	811223	5046.0	119.40	-91.6	88.8
	821217	5050.2	117.40	-152.7	
	831207	5045.2	114.90	-99.8	
	831208	5043.3	126.90	-87.7	
	831209	5043.6	128.50	-92.6	
	841224	5050.0	139.40	-147.5	
	841226	5045.7	135.10	-95.3	
	851214	5042.8	115.10	-99.0	
	851215	5042.5	107.70	-104.7	
	861125	5040.4	115.00	-131.3	
	861126	5042.3	101.50	-95.0	
	880116	5043.2	91.98	-87.7	
	880117	5039.6	96.79	-98.1	
	880118	5042.6	105.40	-97.4	
	880118	5042.9	107.80	-100.4	
	881227	5039.4	110.20	-90.7	
	881228	5041.7	120.10	-95.5	

Table 14. Emission line data of AKN 120 (continued)

Line λ_{rest} Å	Date yyymmdd	λ_{obs} Å	Flux 10^{-14} erg s $^{-1}$ cm $^{-2}$	EW Å	FWHM Å
H β 4861.3	891229	5039.5	126.60	-98.0	
	891230	5034.5	125.40	-97.4	
	900101	5036.7	132.10	-102.5	
	901213	5039.6	127.40	-118.7	
	901214	5038.5	116.40	-117.8	
	901215	5038.0	119.40	-111.9	
	911216	5045.6	88.08	-89.9	
	911217	5044.9	77.99	-91.5	
	911218	5045.3	80.64	-93.0	
	921217	5039.3	101.00	-108.3	
	921219	5038.5	104.80	-111.9	
	931202	5044.6	68.90	-82.9	
	931203	5043.4	99.98	-99.3	
	931204	5043.6	90.20	-105.1	
[OIII] 4959	801212	5121.9	3.34	-2.4	8.9
	811223	5119.6	3.08	-2.0	16.5
	821217	5122.4	3.09	-3.3	24.0
	831207	5120.7	2.44	-1.8	11.2
	831208	5119.8	3.22	-2.0	15.9
	831209	5121.1	3.94	-2.5	17.0
	841224	5120.8	2.37	-2.0	13.0
	841226	5121.5	2.04	-1.3	11.7
	851214	5119.2	2.34	-1.8	10.3
	851215	5120.8	3.65	-3.1	19.8
	861125	5120.4	2.60	-2.6	25.1
	861126	5112.5	2.77	-2.3	
	880116	5119.6	3.77	-3.3	19.9
	880117	5119.2	4.47	-4.2	21.7
	880118	5120.0	3.00	-2.4	14.2
	880118	5118.6	3.66	-2.9	15.8
	881227	5120.4	3.22	-2.4	18.8
	881228	5122.3	4.86	-3.5	18.3
	891229	5119.6	2.97	-2.1	11.5
	891230	5119.5	2.97	-2.1	11.3
	900101	5119.5	2.96	-2.1	11.1
	901213	5119.7	3.22	-2.6	11.0
	901214	5121.1	2.77	-2.5	10.0
	901215	5118.7	3.00	-2.5	12.5
	911216	5119.1	3.78	-3.4	14.2
	911217	5117.8	4.31	-4.5	18.3
	911218	5120.3	3.80	-3.9	11.6
	921217	5119.2	2.66	-2.5	12.0
	921219	5119.2	3.50	-3.2	13.1
	931202	5119.8	3.33	-3.8	10.7
	931203	5119.3	4.04	-3.6	14.5
	931204	5119.6	2.88	-2.9	11.2
[OIII] 5007	801212	5169.7	10.06	-8.1	13.5
	811223	5170.7	9.33	-6.9	12.9
	821217	5171.6	12.46	-14.8	16.0
	831207	5169.7	9.86	-7.8	14.2
	831208	5169.5	11.18	-7.3	13.0
	831209	5168.6	11.62	-7.9	13.4
	841224	5170.7	15.03	-14.4	14.2
	841226	5169.6	11.33	-7.6	12.8
	851214	5168.5	9.65	-7.7	12.8
	851215	5168.6	9.30	-8.6	15.0
	861125	5171.1	10.51	-11.2	14.6
	861126	5170.6	9.22	-8.1	
	880116	5168.8	9.11	-8.4	12.2
	880117	5169.9	9.32	-9.3	13.8
	880118	5168.8	10.22	-8.8	12.4
	880118	5168.8	10.32	-8.9	
	881227	5170.3	8.85	-7.0	11.0
	881228	5170.2	9.59	-7.2	9.5
	891229	5168.2	9.38	-7.1	11.6
	891230	5169.2	9.94	-7.4	12.1
	900101	5168.9	9.83	-7.4	11.8
	901213	5169.7	10.46	-9.1	12.3
	901214	5169.0	10.59	-10.2	12.7
	901215	5168.4	10.19	-8.9	13.5
	911216	5169.7	9.68	-9.1	10.7
	911217	5167.7	9.30	-10.1	11.4
	911218	5168.9	9.60	-10.3	10.8
	921217	5168.9	9.10	-8.9	11.4
	921219	5168.1	10.19	-10.0	12.2
	931202	5168.0	8.49	-10.1	10.9
	931203	5169.0	10.07	-9.4	10.3
	931204	5168.6	9.53	-10.4	12.0
[FeII], [FeIII] 5270	801212	5425.0	39.77	-42.3	
	811223	5437.7	40.16	-38.3	
	811224	5429.2	35.32	-25.8	
	821217	5440.5	52.73	-95.5	
	831207	5424.2	45.76	-46.0	
	831208	5424.9	50.98	-43.4	
	831209	5421.1	48.49	-40.9	
	841224	5439.8	51.91	-76.7	
	841226	5446.5	50.33	-43.5	
	851214	5438.5	55.06	-57.1	
	851215	5442.4	53.74	-63.6	

Table 14. Emission line data of AKN 120 (continued)

Line λ_{rest} Å	Date yyymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[FeII], [FeIII] 5270	861125	5452.8	36.55	-52.4	
	861126	5444.8	54.05	-61.1	
	880116	5423.2	46.13	-53.6	
	880117	5424.6	45.04	-55.5	
	880118	5433.4	43.83	-44.7	
	891231	5455.9	19.42	-15.7	
	901213	5419.7	44.57	-48.5	
	901214	5417.7	47.09	-57.2	
	901215	5427.6	47.42	-51.9	
	911216	5413.6	35.47	-42.0	
	911217	5425.2	36.28	-49.4	
	911218	5414.8	39.05	-53.7	
	921217	5420.8	41.97	-51.8	
	921219	5420.9	45.61	-58.0	
	931202	5416.1	34.41	-49.1	
	931203	5424.6	41.22	-48.9	
	931204	5417.6	37.38	-51.6	
HeI 5875.6	801212	6081.4	14.31	-17.0	
	811224	6076.8	24.67	-21.1	
	831209	6078.6	18.30	-17.4	
	851215	6080.3	16.28	-19.5	
	880117	6063.5	14.44	-18.7	
	880118	6083.2	21.58	-22.4	
	881226	6083.0	25.92	-27.9	
	891231	6065.6	18.41	-18.4	
	901215	6073.1	21.12	-25.8	
	911218	6074.6	10.73	-16.3	
	921217	6079.4	14.23	-18.6	
	921219	6084.8	15.34	-21.7	
	931204	6077.6	14.11	-22.0	
H α 6562.8	801212	6785.4	373.10	-365.4	
	811224	6782.6	485.90	-392.6	114.1
	831209	6780.2	490.00	-411.5	
	851215	6781.5	372.70	-350.2	
	880117	6779.6	292.30	-330.6	105.5
	880118	6778.9	398.60	-342.3	105.2
	881225	6776.1	417.40	-343.6	
	881226	6776.6	342.00	-317.7	
	891231	6781.0	437.10	-381.3	
	901215	6777.1	428.90	-443.5	
	911216	6774.0	311.60	-361.4	
	911217	6772.3	268.50	-337.1	
	911218	6773.2	296.40	-370.7	
	921217	6776.1	387.50	-442.2	
	921219	6775.5	341.90	-433.9	
	931202	6775.6	241.50	-339.6	
	931203	6776.1	298.00	-353.3	
	931204	6776.7	295.10	-406.0	

Table 15. Emission line data of NGC 3783

Line λ_{rest} Å	Date yyymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[OII] 3727b	801211	3763.7	6.00	-4.7	10.0
	831207	3759.8	9.07	-6.7	
	891229	3772.1	32.92	-7.4	
	900101	3763.0	12.84	-3.1	
	911216	3763.2	7.67	-3.0	
	911217	3760.5	7.94	-2.9	
	921219	3762.2	8.98	-2.3	
	931202	3763.2	18.08	-3.7	
	931203	3762.2	9.64	-2.7	
	931204	3762.1	10.80	-2.8	
[OIII] 3759.9	801211	3790.5	2.50	-2.0	11.9
	900101	3795.8	15.45	-4.0	
	931203	3792.1	5.58	-1.6	
	931204	3793.0	5.98	-1.7	
[NeIII] 3869.7	791217	3909.4	11.13	-9.2	
	801211	3908.0	13.78	-13.5	
	811223	3908.2	12.85	-3.7	13.2
	831207	3907.1	10.74	-8.3	
	841224	3908.3	13.94	-10.3	
	851213	3903.1	8.78	-3.7	11.3
	891229	3910.0	25.16	-7.3	
	900101	3907.9	18.42	-6.0	
	901213	3911.8	18.68	-7.7	
	901214	3910.2	17.34	-7.0	
	911216	3908.7	14.81	-6.3	
	911217	3905.7	17.00	-7.4	
	921217	3910.8	28.47	-8.6	
	921219	3909.1	23.28	-7.7	
	931202	3913.6	42.91	-12.3	
	931203	3911.0	26.29	-9.3	
	931204	3910.1	27.93	-9.9	
[NeIII], H ϵ 3969	791217	4008.5	14.01	-15.1	26.8
	801211	4004.3	5.40	-6.3	15.6
	811223	4016.2	29.53	-11.2	
	821217	4002.1	10.48	-8.6	
	831207	3999.1	10.31	-10.2	
	841224	4006.8	10.56	-10.5	
	851213	4003.2	16.53	-10.0	
	880116	4012.5	7.98	-4.8	
	880116	3981.4	4.64	-2.9	2.7
	891229	4003.9	28.13	-11.6	
	900101	4005.8	19.69	-8.7	
	901213	4006.6	18.59	-8.9	
	901214	4004.2	17.90	-8.4	
	911216	4007.1	16.91	-9.0	
	911217	4005.0	17.74	-9.7	
	921217	4006.0	21.71	-8.1	
	921219	4005.9	21.77	-8.9	
	931202	4007.8	35.61	-12.6	
	931203	4005.9	23.13	-9.8	
	931204	4006.3	25.50	-11.0	
H δ 4101.7	791217	4142.0	28.34	-31.6	45.8
	801211	4141.8	20.30	-27.2	
	811223	4142.5	47.07	-19.4	
	821217	4138.1	23.49	-21.6	
	831207	4139.1	20.79	-23.8	
	841224	4138.7	17.12	-20.7	
	851213	4134.8	28.15	-20.4	
	880116	4131.7	24.25	-16.9	
	891229	4140.2	37.51	-18.8	
	900101	4140.6	33.66	-17.2	
	901213	4140.3	44.05	-24.2	
	901214	4140.3	40.19	-21.9	
	911216	4141.3	29.60	-17.2	
	911217	4139.5	31.79	-19.6	
	921217	4139.3	51.35	-22.9	
	921219	4138.3	46.27	-22.0	
	931202	4141.2	62.93	-26.5	
	931203	4139.6	49.02	-23.8	
	931204	4138.9	48.93	-24.6	
H γ 4340.5	791217	4388.6	51.74	-56.1	
	801211	4388.6	41.15	-56.6	
	811223	4387.6	75.60	-36.7	
	821217	4388.2	42.84	-42.4	
	831207	4386.6	42.84	-52.4	
	841224	4390.0	42.07	-49.3	
	851213	4382.3	59.27	-45.8	
	880116	4384.8	40.01	-28.5	
	881227	4381.1	34.40	-27.8	
	891229	4384.6	66.18	-39.5	
	900101	4385.9	71.41	-44.4	
	901213	4384.3	73.20	-43.5	
	901214	4384.0	70.16	-42.4	
	901215	4385.0	63.96	-38.8	
	911216	4386.1	50.15	-32.2	
	911217	4385.4	47.48	-32.2	
	921217	4383.3	68.53	-36.5	
	921219	4382.0	66.71	-37.5	
	931202	4385.9	86.07	-42.8	
	931203	4382.9	70.57	-38.6	
	931204	4382.7	74.39	-43.6	

Table 15. Emission line data of NGC 3783 (continued)

Line λ_{rest} Å	Date yyymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
NIII 4636b	831207	4667.7	34.55	-43.6	
	841224	4664.2	29.23	-33.2	
	841224	4680.2	24.35	-27.2	
	851213	4673.3	60.54	-44.7	
	880116	4658.6	37.10	-26.9	
	881227	4656.6	29.03	-24.5	
	891229	4663.6	41.48	-28.4	
	901213	4689.0	80.00	-51.2	
	901215	4696.8	75.80	-51.2	
	911216	4680.1	48.38	-34.6	
	911217	4680.6	36.96	-27.5	
HeII 4685.7	791217	4720.3	29.67	-33.1	
	801211	4725.7	16.61	-21.9	
	811223	4719.9	50.42	-26.0	
	821217	4711.4	20.27	-20.6	
	831207	4730.1	3.36	-3.8	12.8
	841224	4731.3	3.26	-3.3	10.2
	880116	4730.9	5.33	-3.6	15.8
	900101	4707.8	24.00	-15.8	
	901214	4704.3	66.37	-43.0	
	911216	4731.0	3.43	-2.1	11.0
	911217	4728.5	2.28	-1.5	8.7
	921217	4703.5	31.60	-19.8	
	921217	4729.8	4.95	-2.9	11.6
	921219	4702.4	37.87	-24.1	
	931202	4703.4	61.08	-35.8	
	931203	4705.4	56.86	-34.9	
	931204	4716.0	40.69	-26.3	
H β 4861.3	791217	4909.1	83.14	-87.7	42.5
	801211	4908.9	59.18	-69.7	42.6
	811223	4908.5	126.10	-67.2	53.4
	821217	4911.2	79.37	-66.8	48.1
	831207	4909.4	58.81	-64.3	41.4
	841224	4910.3	79.13	-77.2	44.8
	851213	4905.4	102.80	-66.9	45.1
	880116	4906.3	93.18	-62.4	47.7
	880118	4907.4	93.85	-75.0	47.4
	881227	4905.9	61.18	-45.8	
	891229	4907.4	102.20	-69.2	
	900101	4908.5	94.31	-59.3	
	901213	4908.8	134.60	-81.8	
	901214	4908.1	124.40	-74.6	
	901215	4908.2	149.70	-97.8	
	911216	4909.8	92.05	-63.3	
	911217	4907.6	95.43	-71.4	
	921217	4907.7	114.50	-74.5	
	921219	4906.4	116.50	-76.0	
	931202	4906.9	118.30	-71.6	
	931203	4906.7	112.60	-69.9	
	931204	4906.5	117.30	-77.4	
[OIII] 4959	791217	5006.3	24.60	-24.0	8.6
	801211	5006.4	25.75	-27.2	8.9
	811223	5005.5	26.83	-14.4	10.0
	821217	5005.7	25.06	-21.5	9.0
	831207	5006.5	24.61	-26.1	9.5
	841224	5007.5	25.97	-25.4	8.9
	851213	5005.4	24.67	-17.2	8.9
	880116	5006.0	27.80	-19.5	8.2
	880118	5006.8	29.15	-24.0	8.5
	881227	5005.7	28.37	-22.5	7.7
	891229	5006.2	28.41	-20.1	8.0
	900101	5006.0	27.88	-18.5	7.8
	901213	5007.0	27.62	-17.5	7.8
	901214	5006.5	28.69	-18.8	7.7
	901215	5007.2	27.30	-18.0	9.7
	911216	5006.7	28.91	-21.2	7.5
	911217	5004.5	26.19	-20.2	7.0
	921217	5006.0	28.32	-19.3	7.2
	921219	5004.9	28.08	-18.8	7.7
	931202	5005.5	26.76	-16.9	6.3
	931203	5005.4	27.38	-18.4	6.6
	931204	5005.1	27.47	-18.9	6.8
[OIII] 5007	791217	5054.7	87.47	-86.4	9.6
	801211	5054.5	85.92	-95.8	9.6
	811223	5053.6	86.29	-47.5	9.8
	821217	5054.2	86.31	-73.1	9.8
	831207	5054.5	85.73	-96.9	9.7
	841224	5055.9	87.85	-88.1	8.7
	851213	5053.6	86.84	-62.2	9.3
	880116	5054.3	87.59	-63.9	8.2
	880118	5055.3	86.22	-71.8	8.4
	881227	5054.1	86.08	-71.8	7.6
	891229	5054.6	87.34	-67.5	8.1
	900101	5054.4	86.43	-61.2	7.8
	901213	5055.4	86.55	-55.6	8.0
	901214	5054.7	86.76	-56.7	7.7
	901215	5055.5	89.89	-61.7	10.1
	911216	5055.1	85.53	-63.3	7.3
	911217	5052.9	85.91	-69.3	7.3
	921217	5054.4	86.79	-61.3	7.3
	921219	5053.4	85.63	-58.9	7.9
	931202	5053.8	85.96	-56.9	5.1
	931203	5053.7	85.57	-59.0	6.9
	931204	5053.5	87.42	-62.3	7.2

Table 15. Emission line data of NGC 3783 (continued)

Line λ_{rest} Å	Date yyymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[FeVII] 5720.9	791217	5773.0	2.37	-3.1	13.4
	801211	5774.5	2.15	-3.4	12.8
	811224	5774.2	2.02	-1.7	
	821217	5777.5	2.86	-3.4	
	831209	5775.7	2.99	-3.9	
	841224	5775.9	2.12	-2.9	
	841227	5776.5	2.64	-3.3	
	851213	5773.3	1.65	-1.4	9.0
	851216	5776.2	1.79	-1.4	
	880117	5776.2	2.65	-2.2	11.2
	880118	5775.7	3.33	-2.7	12.0
	891231	5774.8	2.38	-2.6	
	901215	5775.8	2.52	-2.1	
	911216	5775.7	2.08	-2.0	10.8
HeI 5875.6	911217	5772.8	2.17	-2.3	
	921217	5774.6	2.47	-2.3	
	921219	5773.8	2.12	-1.9	
	931202	5773.8	2.82	-2.4	11.4
	931203	5773.2	2.15	-1.9	10.7
	931204	5773.5	2.37	-2.1	
[FeVII], CaV 6085.3	801212	5920.6	10.10	-8.7	
	811224	5940.0	20.66	-17.4	
	821217	5930.3	17.69	-20.6	
	831209	5933.3	13.95	-17.8	
	841224	5938.7	17.16	-23.1	
	841227	5937.8	17.52	-21.8	
	851213	5932.8	20.20	-17.0	53.2
	851216	5931.9	18.50	-14.1	
	880118	5927.2	9.25	-7.0	29.2
	881225	5928.9	2.76	-2.8	
	891231	5940.9	19.35	-21.2	
	901215	5930.9	20.23	-16.1	
	911216	5938.2	13.27	-13.0	
	911217	5934.7	13.78	-14.5	
[FeVII], CaV 6085.3	921217	5929.5	20.08	-18.8	
	921219	5930.2	19.42	-17.3	
	931203	5929.9	17.74	-16.0	
	931204	5930.0	22.07	-19.1	
[FeVII], CaV 6085.3	801212	6147.0	6.52	-5.9	
	811224	6140.8	4.85	-4.3	15.8
	831209	6144.2	4.35	-5.6	15.4
	841227	6146.5	3.97	-5.1	13.7
	851216	6142.5	5.36	-4.3	
	880117	6142.3	5.15	-4.3	15.0
	880118	6143.2	5.22	-4.0	12.1
	881225	6143.1	3.82	-4.1	
	891231	6143.2	4.63	-5.3	15.5
	901215	6140.6	5.58	-4.8	17.2
	911216	6143.6	4.61	-4.7	14.1
	911217	6141.5	4.80	-5.3	14.2
	921217	6143.0	5.06	-4.9	
	921219	6143.3	5.23	-4.8	14.4
[OI] 6300.2	931202	6142.4	3.96	-3.4	12.5
	931203	6142.3	4.73	-4.5	15.5
	931204	6142.5	5.23	-4.7	15.0
[OI] 6300.2	801212	6360.6	4.25	-3.6	
	811224	6358.5	3.16	-2.7	12.4
	831209	6363.0	4.55	-6.1	12.5
	841227	6364.0	3.04	-3.7	8.0
	851216	6361.6	3.10	-2.3	9.4
	880117	6362.0	5.04	-4.3	8.7
	880118	6361.3	4.86	-3.5	7.4
	881225	6362.6	3.15	-3.4	7.9
	891231	6362.7	3.25	-3.7	8.3
	901215	6359.6	3.97	-3.4	
	911216	6362.6	3.25	-3.2	7.6
	911217	6360.0	3.01	-3.2	6.5
	921219	6361.0	3.10	-2.9	
	931202	6361.1	3.26	-2.7	
[OI] 6363.9	931203	6360.5	2.98	-2.8	
	931204	6360.7	3.41	-3.0	
[OI] 6363.9	811224	6425.7	4.30	-3.6	20.9
	831209	6431.3	4.08	-5.1	23.4
	841227	6431.4	5.78	-6.9	
	851216	6429.2	4.35	-3.1	
	880117	6429.9	5.30	-4.3	20.2
	880118	6427.4	7.35	-5.1	
	881225	6426.6	3.03	-3.2	
	891231	6428.1	3.92	-4.2	
	901215	6428.4	7.81	-6.4	
	911216	6432.2	3.72	-3.6	20.2
	911217	6425.9	3.84	-4.0	17.4
	921217	6429.2	5.49	-5.0	
	921219	6429.5	5.42	-4.9	20.5
	931202	6427.2	4.77	-3.9	
[OI] 6363.9	931203	6427.9	5.39	-5.0	26.4
	931204	6427.1	6.61	-5.7	

Table 15. Emission line data of NGC 3783 (continued)

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
H α 6562.8	801212	6626.2	281.50	-194.0	
	811224	6625.9	417.20	-305.2	
	831209	6627.7	338.10	-320.2	56.6
	841227	6630.0	438.20	-436.8	
	851216	6624.1	552.10	-319.8	60.9
	880117	6623.2	395.20	-266.9	
	880118	6623.5	571.50	-325.1	
	881225	6624.0	347.60	-299.6	
	891231	6626.6	383.00	-350.8	
	901215	6626.4	508.80	-352.7	
	911216	6627.8	403.10	-361.0	
	911217	6625.7	407.10	-373.2	
	921217	6626.0	422.60	-347.5	
	921219	6625.0	423.70	-350.1	
	931202	6624.5	390.00	-294.5	
	931203	6624.3	372.80	-318.7	
	931204	6624.4	455.80	-366.3	
[SII] 6717.0 6731.3	801212	6788.0	8.23	-6.8	
	811224	6787.1	8.27	-7.1	
	831209	6790.0	8.12	-10.0	
	841227	6792.3	8.14	-9.3	
	851216	6788.9	7.89	-5.7	
	880117	6789.1	8.97	-7.6	
	880118	6789.6	12.09	-8.6	
	881225	6789.6	8.65	-9.2	
	891231	6789.2	7.08	-7.8	
	901215	6788.7	7.18	-6.0	
	911216	6789.8	6.90	-6.9	
	911217	6788.1	7.09	-7.8	
	921217	6789.1	7.03	-6.8	
	921219	6788.8	7.13	-6.8	
	931202	6787.3	7.73	-7.2	
	931203	6787.8	6.18	-6.3	
	931204	6788.7	6.93	-6.6	

Table 16. Emission line data of NGC 4507

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[OII] 3727b	801211	3769.9	12.79	-75.8	10.2
	900101	3770.7	18.36	-109.3	7.1
[NeIII] 3869.7	791217	3911.1	4.20	-25.3	13.1
	800826	3914.2	9.18	-52.6	21.4
	801211	3913.7	3.86	-24.9	10.9
	811223	3918.2	5.20	-23.3	11.3
	900101	3914.1	5.29	-26.2	7.4
[NeIII], He 3969	791217	4014.4	1.24	-9.7	12.6
	801211	4014.6	1.50	-12.1	9.5
	811223	4019.0	1.49	-6.6	10.1
	900101	4014.9	1.61	-8.5	6.7
[SII] 4072b	801211	4115.4	1.22	-8.3	
	900101	4117.9	1.06	-5.2	10.8
H δ 4101.7	801211	4149.3	1.14	-7.3	
	900101	4150.0	1.80	-8.7	8.7
H γ 4340.5	791217	4399.2	7.76	-46.6	
	791217	4391.6	2.55	-12.4	9.9
	791217	4414.8	2.33	-11.5	13.1
	800826	4397.4	7.47	-34.4	
	801211	4400.6	5.48	-34.9	
	811223	4397.1	7.09	-27.7	
	881228	4401.8	5.74	-19.0	
	900101	4398.6	5.32	-25.9	
HeII 4685.7	791217	4739.9	1.16	-4.8	10.7
	800826	4738.7	1.00	-3.7	12.3
	801211	4739.9	0.89	-4.3	11.2
	900101	4739.4	1.05	-4.5	
H β 4861.3	791217	4918.3	5.71	-22.8	10.1
	800826	4917.6	5.57	-19.3	11.8
	801211	4919.1	5.73	-24.8	
	811223	4917.1	5.20	-13.8	10.2
	881228	4917.5	5.18	-12.4	7.0
	900101	4917.5	6.60	-27.2	8.1
[OIII] 4959	791217	5016.8	16.62	-43.3	10.6
	800826	5015.5	16.73	-46.7	14.3
	801211	5016.3	19.77	-62.5	10.4
	811223	5015.7	18.21	-46.2	12.1
	881228	5015.0	18.24	-39.0	8.7
	900101	5015.6	18.51	-66.1	9.1

Table 16. Emission line data of NGC 4507 (continued)

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[OIII] 5007	791217	5065.3	57.51	-155.6	11.5
	800826	5062.7	56.97	-148.2	13.8
	801211	5064.7	57.93	-177.4	10.9
	811223	5064.3	56.52	-139.6	12.2
	881228	5063.5	54.61	-112.9	8.4
	900101	5064.2	56.94	-210.1	9.2
HeI 5875.6	811224	5942.9	0.67	-2.6	
[OI] 6300.2	800826	6374.9	2.98	-8.9	13.5
	801212	6373.8	3.09	-9.0	11.0
	811224	6372.9	3.38	-12.3	12.4
	881226	6375.4	4.64	-9.6	10.4
[OI] 6363.9	800826	6444.1	1.68	-5.1	19.1
	801212	6439.1	0.93	-2.6	6.6
	811224	6440.3	1.13	-4.0	16.0
H α 6562.8	800826	6644.3	56.37	-145.5	
	801212	6644.4	44.22	-116.0	
	811224	6641.8	43.87	-140.6	
	881226	6643.8	56.62	-107.2	
[SII] 6717.0, 6731.3	800826	6802.3	10.73	-30.0	
	801212	6802.7	8.97	-25.4	
	811224	6800.8	9.82	-33.4	
	881226	6802.0	13.52	-30.1	

Table 17. Emission line data of IC 4329A

Line λ_{rest} Å	Date yymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
H δ 4101.7	791217	4140.8	12.41	-60.8	
	911217	4165.8	6.26	-19.7	
H γ 4340.5	791217	4431.9	16.08	-47.0	
	800826	4415.4	10.20	-21.2	
	811223	4418.1	7.62	-21.3	
	821217	4417.4	12.82	-47.5	
	841225	4418.3	12.18	-44.2	
	880116	4419.9	5.15	-13.8	
	891230	4418.0	8.00	-23.1	
	911217	4422.4	11.12	-28.0	
	921218	4418.3	9.96	-22.8	
	921219	4420.4	9.06	-19.8	
FeII 4570	791217	4690.0	16.65	-40.4	
	911217	4670.4	15.15	-33.3	
	921219	4673.2	10.59	-22.2	
HeII 4685.7	791217	4759.9	1.02	-2.2	
	880116	4735.4	1.05	-2.2	5.3
H β 4861.3	791217	4944.4	26.55	-49.0	
	800826	4937.1	30.16	-55.1	
	800826	4942.4	29.64	-47.9	
	811223	4937.6	23.22	-43.7	
	821217	4941.3	25.74	-53.0	
	841225	4941.2	26.59	-61.7	
	880116	4936.5	18.81	-34.8	
	880117	4940.8	18.70	-35.6	
	880118	4940.8	17.16	-35.9	
	881228	4941.6	18.64	-37.0	
	891230	4940.2	25.19	-50.0	
	911217	4940.3	32.39	-54.7	
[OIII] 4959	921218	4944.2	27.06	-46.6	
	921219	4943.2	23.62	-39.8	
	791217	5037.9	4.78	-7.8	12.1
	800825	5037.2	5.08	-8.3	14.7
	800826	5037.2	4.54	-6.7	
	811223	5033.9	5.56	-9.7	
	821217	5036.3	5.42	-10.2	
	841225	5037.2	5.10	-10.6	13.1
	880116	5036.7	5.23	-9.0	11.4
	880117	5037.1	4.76	-8.1	12.4
[OIII] 4959	880118	5036.8	5.40	-10.8	14.3
	881228	5036.2	5.44	-9.7	9.5
	891230	5037.9	4.97	-9.2	9.1
	911217	5035.6	5.40	-8.4	12.0
	921218	5036.2	5.50	-8.9	11.8
	921219	5036.1	4.86	-7.6	11.9

Table 17. Emission line data of IC 4329A (continued)

Line λ_{rest} Å	Date yyymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[OIII] 5007	791217	5086.6	17.24	-29.4	12.7
	800825	5084.8	16.75	-27.0	14.2
	800826	5084.6	16.65	-24.4	
	811223	5082.6	17.44	-31.0	
	821217	5086.7	16.56	-30.3	
	841225	5087.0	16.70	-34.3	12.4
	880116	5085.9	15.58	-26.2	11.3
	880117	5087.0	15.46	-26.7	12.2
	880118	5086.0	16.05	-32.4	12.3
	881228	5085.8	15.31	-29.2	10.7
	891230	5086.6	15.86	-30.1	11.8
	911217	5084.5	16.62	-26.5	11.7
	921218	5085.4	16.02	-26.2	11.6
	921219	5085.3	16.12	-25.7	11.8
[FeII], [FeIII] 5270	791217	5374.3	24.04	-46.4	
	911217	5344.7	13.40	-22.1	
	921218	5350.1	13.78	-24.5	
HeI 5875.6	800825	5980.1	26.96	-32.9	
	800826	5975.4	18.67	-22.5	
	811224	5989.9	11.33	-19.8	
	851216	5973.7	12.13	-19.6	
	891231	5987.3	14.26	-22.8	
	911217	5970.6	9.96	-13.0	
	921218	5973.4	7.15	-10.0	
	921219	5972.2	7.86	-10.8	
[FeVII], CaV 6085.3	911217	6183.1	1.18	-1.4	
	921218	6181.8	1.20	-1.6	18.6
	921219	6185.2	0.97	-1.2	13.2
OI 6300.2	800826	6402.3	1.93	-2.0	11.9
	811224	6398.5	1.80	-2.6	16.6
	851216	6397.4	0.84	-1.1	6.9
	891231	6400.4	1.59	-2.2	12.0
	911217	6398.6	1.37	-1.5	
	921218	6399.0	1.12	-1.4	10.4
	921219	6399.6	1.64	-2.1	15.8
H α 6562.8	800825	6675.3	412.80	-278.0	
	800826	6674.8	414.40	-335.9	
	811224	6673.3	310.40	-353.3	
	851216	6672.5	328.80	-329.9	
	880117	6674.4	206.90	-230.3	
	880118	6674.3	244.60	-262.4	
	881226	6675.1	256.00	-276.0	
	891231	6675.6	301.20	-309.4	
	911217	6671.7	333.40	-314.8	
	921218	6674.2	261.10	-293.5	
	921219	6674.7	256.90	-274.7	
[SII] 6717, 6731.3	800825	6830.7	6.32	-4.2	
	811224	6828.4	5.36	-6.2	
	851216	6826.6	3.82	-3.8	
	880117	6831.6	4.36	-5.1	
	880118	6828.7	6.56	-7.3	
	891231	6829.2	5.40	-6.0	
	921218	6829.7	3.46	-3.9	

Table 18. Emission line data of NGC 7469

Line λ_{rest} Å	Date yyymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[OII] 3727b	801211	3785.4	5.38	-4.7	11.0
	911218	3786.3	4.30	-4.3	9.9
	921217	3786.8	5.33	-6.9	7.9
	921219	3787.0	4.57	-5.1	8.2
	931202	3786.5	5.26	-6.4	7.5
[NeIII] 3869.7	800825	3933.3	5.76	-8.6	30.2
	801211	3936.2	12.83	-13.5	42.8
	831208	3925.8	7.61	-6.3	
	851214	3938.1	13.01	-12.7	
	911218	3939.8	9.82	-9.8	
	921217	3929.8	5.74	-7.1	
	921219	3932.8	8.54	-9.4	
	931202	3931.5	8.08	-9.6	
[NeIII], H ϵ 3969	800826	4032.8	2.61	-3.0	22.5
	801211	4037.9	8.38	-9.5	51.6
	911218	4032.3	5.42	-5.4	
	921219	4029.3	3.73	-4.2	
H δ 4101.7	800825	4174.7	11.40	-17.1	59.5
	800826	4169.7	6.85	-8.2	42.8
	801211	4165.8	16.11	-18.7	
	831208	4167.1	17.50	-16.3	

Table 18. Emission line data of NGC 7469 (continued)

Line λ_{rest} Å	Date yyymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
H δ 4101.7	851214	4169.0	15.47	-17.0	
	911218	4167.9	15.58	-15.6	43.0
	921217	4163.6	11.68	-14.7	57.2
	921219	4164.6	10.88	-12.2	40.3
	931202	4167.2	10.33	-12.4	41.9
H γ 4340.5	800825	4417.7	26.12	-35.6	
	800826	4416.0	21.06	-26.7	51.9
	801211	4415.7	28.93	-34.3	53.4
	831208	4415.2	29.03	-25.8	
	851214	4415.7	26.34	-28.3	
	881228	4412.0	9.00	-13.7	
	891230	4416.9	15.84	-23.4	
	901216	4416.4	21.10	-19.7	
	911216	4421.5	37.58	-34.3	
	911218	4417.9	30.39	-29.5	
	921217	4415.1	19.46	-23.2	
FeII 4570	921219	4416.6	25.50	-28.5	
	931202	4415.1	22.00	-25.5	
FeII 4570	800825	4660.6	24.37	-30.4	
	801211	4692.6	33.88	-40.4	
	831208	4681.8	33.55	-30.4	
	851214	4679.3	46.11	-48.5	
	901216	4667.3	36.10	-36.1	
	911216	4689.4	44.35	-40.2	
	911218	4681.0	37.31	-35.6	
	921217	4651.1	30.66	-36.3	
	921219	4671.1	32.07	-36.8	
	931202	4678.1	31.02	-36.2	
H β 4861.3	800825	4942.5	46.03	-47.6	40.6
	800826	4938.7	48.88	-48.5	42.5
	801211	4942.3	47.11	-50.1	42.1
	831208	4944.6	45.98	-37.6	
	851214	4942.9	47.53	-42.5	
	881228	4940.5	29.09	-42.7	
	891230	4940.9	31.93	-38.4	
	901216	4943.3	46.16	-42.7	
	911216	4940.6	46.53	-37.8	
	911218	4939.9	44.13	-36.2	
	921217	4938.2	34.84	-35.2	
HeII 4685.7	921219	4938.3	31.52	-31.2	
	931202	4939.0	40.61	-40.0	
HeII 4685.7	800825	4760.0	1.88	-2.2	14.2
[OIII] 4959	800825	5036.8	11.71	-11.7	12.3
	800826	5035.9	9.62	-9.3	11.2
	801211	5037.7	12.30	-12.3	9.9
	831208	5037.4	12.82	-10.2	10.6
	851214	5037.7	11.70	-10.3	9.4
	881228	5037.5	10.91	-14.7	7.6
	891230	5036.8	12.79	-15.3	9.0
	901216	5037.4	13.49	-12.4	10.5
	911216	5037.7	13.07	-10.8	8.4
	911218	5037.6	12.02	-10.1	
	921217	5036.6	12.72	-12.9	8.4
[OIII] 5007	921219	5037.5	12.65	-13.0	7.5
	931202	5036.5	11.98	-11.6	7.7
[OIII] 5007	800825	5084.4	46.21	-46.1	13.3
	800826	5082.8	43.07	-41.5	12.6
	801211	5085.7	43.02	-41.6	9.9
	831208	5086.0	41.24	-32.7	10.0
	851214	5086.2	44.41	-40.1	10.3
	881228	5085.9	34.71	-49.0	7.6
	891230	5085.8	41.47	-47.0	8.8
	901216	5086.3	44.76	-41.5	10.7
	911216	5086.5	41.85	-35.4	8.2
	911218	5086.1	45.08	-39.2	
	921217	5085.2	44.02	-44.4	8.6
HeI 5875.6	921219	5086.1	43.47	-45.0	7.9
	931202	5085.1	42.60	-41.3	8.6
HeI 5875.6	800825	5973.6	18.58	-21.3	84.9
	800826	5971.9	12.29	-14.4	
	801212	5977.0	12.19	-15.0	
	851215	5962.8	10.77	-8.0	
	901216	5969.8	11.19	-12.6	
	911216	5970.1	9.12	-8.6	
	911218	5974.4	15.57	-15.9	
	921217	5971.6	8.70	-10.2	
	921219	5969.6	6.43	-8.6	
	931202	5977.5	12.86	-14.3	
[FeVII], CaV 6085.3	800825	6177.2	2.40	-2.9	19.5
	800826	6175.5	1.74	-2.1	22.0
	911218	6180.3	1.80	-1.8	16.0
	921217	6179.7	1.62	-1.9	17.3
	921219	6181.6	1.18	-1.6	14.1
	931202	6180.2	1.45	-1.6	14.9

Table 18. Emission line data of NGC 7469 (continued)

Line λ_{rest} Å	Date yyymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[OII] 6300.2	800825	6402.0	2.51	-2.9	13.3
	800826	6400.3	2.47	-2.9	14.6
	801212	6401.4	4.62	-5.4	
	901216	6400.6	2.48	-3.0	11.5
	911216	6403.4	2.69	-2.6	
	911218	6402.8	2.57	-2.6	8.0
	921217	6402.6	2.80	-3.4	7.9
	921219	6403.2	2.14	-3.1	7.8
	931202	6402.6	2.95	-3.4	8.2
[OII] 6363.9	801212	6468.8	3.02	-3.5	
	901216	6468.5	1.39	-1.6	
	911218	6469.3	1.46	-1.4	12.6
	921217	6467.7	1.32	-1.5	12.8
	921219	6468.0	1.18	-1.7	11.3
	931202	6469.5	1.44	-1.6	14.3
H α 6562.8	800825	6673.7	330.30	-318.0	
	800826	6672.4	372.10	-344.2	53.2
	801212	6674.5	286.50	-286.1	
	851215	6674.1	444.40	-254.7	
	901216	6674.6	227.60	-235.3	
	911216	6674.4	257.70	-215.5	
	911218	6673.8	277.10	-244.1	
	921217	6673.4	229.90	-233.6	
	921219	6673.5	175.50	-225.7	
	931202	6672.7	255.50	-254.1	
[SII] 6717.0, 6731.3	800825	6833.7	13.38	-13.8	
	800826	6831.6	10.46	-10.2	
	801212	6834.0	12.81	-13.9	
	851215	6834.2	24.23	-15.0	
	901216	6833.5	11.77	-13.7	
	911216	6834.4	13.76	-13.6	
	911218	6833.0	9.90	-9.7	
	921217	6833.7	12.26	-15.2	
	921219	6833.5	9.68	-15.0	
	931202	6833.9	11.23	-13.1	

Table 19. Emission line data of MCG-2-58-22

Line λ_{rest} Å	Date yyymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[OII] 3727b	800825	3904.6	4.74	-7.5	15.6
	801211	3903.4	7.54	-12.3	10.1
	861125	3900.5	9.27	-11.5	10.1
	891229	3901.7	18.78	-64.0	
	891230	3902.2	9.15	-40.4	10.2
	901214	3902.5	7.08	-16.7	
	911217	3902.5	7.82	-8.7	8.3
	921218	3901.5	6.23	-21.0	8.8
	931203	3902.3	8.00	-38.7	8.9
[NeIII] 3869.7	800825	4058.1	3.86	-6.4	
	801211	4056.5	5.13	-9.7	22.8
	901214	4053.6	4.47	-12.9	
	911217	4050.7	2.28	-3.0	11.0
	921218	4055.7	4.72	-19.3	
	931203	4050.6	2.55	-13.5	9.0
He I, [NeIII] 3969	921218	4152.1	1.39	-5.6	
[SII] 4072b	891230	4276.5	5.72	-25.4	
H γ 4340.5	800825	4547.5	11.80	-22.0	
	801211	4555.0	11.06	-28.8	
	831207	4553.0	7.58	-10.5	
	841224	4556.5	10.78	-14.1	
	841226	4556.4	9.66	-14.5	
	851213	4547.8	14.26	-22.0	
	861125	4554.3	14.54	-27.6	
	891229	4551.7	7.69	-32.0	
	901214	4558.9	2.84	-9.2	
	901215	4562.3	6.89	-24.6	
	911217	4558.3	16.83	-33.5	
	921218	4555.7	11.86	-59.3	
	931203	4557.6	4.67	-25.5	
	791217	5082.9	17.13	-27.0	69.3
	800825	5085.7	19.65	-29.0	
	801211	5083.3	20.28	-49.7	76.3
	801212	5079.2	23.29	-54.4	
	821217	5081.3	25.14	-40.0	
	831207	5071.5	26.53	-40.0	
	841224	5088.9	22.55	-27.1	
	841226	5087.7	21.69	-26.2	
	851213	5083.6	26.55	-37.5	
	851216	5079.9	28.57	-40.2	

Table 19. Emission line data of MCG-2-58-22 (continued)

Line λ_{rest} Å	Date yyymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
H β 4861.3	861125	5085.3	21.42	-37.6	
	881227	5079.9	13.85	-54.9	
	891229	5080.3	9.70	-37.9	
	891230	5079.2	10.12	-40.6	
	901214	5075.5	9.64	-31.3	
	901215	5079.0	8.46	-26.0	
	911217	5074.1	13.66	-25.9	
	921218	5079.4	12.69	-47.0	
	931203	5083.5	8.25	-37.1	
	791217	5193.5	6.06	-8.9	11.0
[OIII] 4959	800825	5191.7	6.87	-9.4	13.2
	801211	5191.9	6.69	-14.8	10.9
	801212	5192.3	7.22	-15.1	10.4
	821217	5193.7	5.32	-7.1	9.8
	831207	5193.4	6.79	-8.9	10.7
	841224	5193.4	7.78	-8.8	11.8
	841226	5192.8	7.10	-7.9	11.4
	851213	5191.1	6.60	-8.5	11.8
	851216	5192.3	8.68	-11.1	11.7
	861125	5193.5	7.60	-12.7	11.9
	881227	5192.6	6.36	-17.9	9.1
	891229	5192.4	7.35	-25.5	10.8
	891230	5192.2	5.91	-17.3	9.2
	901214	5192.8	7.48	-22.8	10.6
	901215	5193.1	7.90	-23.1	11.8
	911217	5192.3	7.30	-13.4	9.9
	921218	5191.8	7.35	-25.7	9.7
	931203	5191.8	7.55	-31.0	10.0
[OIII] 5007	791217	5244.4	23.36	-37.1	11.4
	800825	5242.2	25.24	-36.4	14.1
	801211	5242.1	23.49	-53.1	11.6
	801212	5242.7	23.55	-52.3	11.9
	821217	5243.6	22.10	-32.2	11.8
	831207	5243.6	22.88	-31.3	11.7
	841224	5243.8	22.94	-27.4	11.5
	841226	5242.8	23.38	-28.0	11.4
	851213	5242.0	22.89	-31.7	11.6
	851216	5242.6	24.07	-33.2	11.6
	861125	5243.8	24.62	-43.6	12.2
	881227	5243.1	20.25	-79.6	9.9
	891229	5242.5	22.13	-80.8	10.4
	891230	5242.7	22.25	-79.9	10.3
	901214	5243.0	22.02	-74.6	9.9
	901215	5243.6	23.04	-78.1	11.4
	911217	5242.7	23.57	-51.6	9.8
	921218	5242.5	22.84	-96.9	9.8
	931203	5242.2	23.04	-110.8	9.8
[NI] 5198.5	921218	5443.8	0.38	-2.2	7.4
	931203	5443.6	0.67	-4.1	9.0
He I 5875.6	791217	6132.2	11.95	-28.6	
	921218	6127.7	1.85	-10.7	
[OI] 6300.2	791217	6000.9	2.78	-6.6	13.9
	800825	6599.1	2.53	-4.6	14.5
	811224	6598.2	1.80	-6.4	12.9
	851216	6596.6	3.30	-6.2	14.1
	891231	6596.5	1.94	-8.7	
	901215	6597.3	1.76	-7.6	
	911217	6598.5	2.06	-6.2	8.6
	921218	6598.0	2.38	-14.6	12.0
	931203	6597.2	2.16	-11.0	11.5
[OI] 6363.9	911217	6663.7	0.82	-2.4	12.1
	921218	6664.8	0.54	-3.1	12.2
	931203	6663.3	0.74	-3.5	10.7
H α 6562.8	801212	6866.7	202.40	-386.2	
	811224	6862.0	114.20	-299.3	
	851216	6868.5	167.70	-216.3	
	891231	6868.5	70.61	-223.9	
	901215	6867.6	76.76	-201.8	
	911217	6870.1	114.90	-268.9	
	921218	6875.9	108.80	-480.0	
	931203	6874.5	71.39	-269.3	
[SII] 6717, 6731.3	811224	7040.7	4.46	-10.9	
	851216	7037.1	5.45	-6.8	
	891231	7039.9	4.63	-13.1	
	901215	7038.8	2.82	-7.1	
	911217	7040.2	3.38	-8.1	
	921218	7039.8	3.61	-16.2	
	931203	7039.3	4.60	-18.8	

Table 20. Emission line data of NGC 7603

Line λ_{rest} Å	Date yyymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[OII] 3727b	801211	3835.9	2.78	-7.7	11.3
H γ 4340.5	901217	4448.2	6.56	-17.7	
	911218	4463.4	8.63	-27.5	
	921217	4462.1	8.90	-22.5	
	921218	4459.0	11.16	-30.5	
	921219	4452.4	14.10	-37.7	
	931204	4459.6	21.87	-32.5	
FeII 4570	801211	4687.5	10.07	-22.6	
	811223	4673.2	6.95	-24.0	
	901217	4687.4	9.94	-27.8	
	911218	4691.6	16.34	-51.6	
	921217	4671.5	11.64	-30.9	
	921218	4674.1	22.07	-62.9	
	921219	4676.8	15.65	-42.9	
	931204	4688.2	21.45	-34.3	
H β 4861.3	800825	4988.6	13.50	-32.5	103.6
	801211	4981.5	14.38	-30.9	86.6
	801212	4982.4	12.86	-26.9	93.9
	811223	4985.0	8.28	-26.0	
	831208	4992.3	13.97	-35.4	
	841225	4985.4	12.67	-29.0	
	851214	4988.8	9.38	-28.7	
	891229	4995.6	12.80	-43.6	
	891230	4992.6	14.32	-43.7	
	901217	4992.7	16.01	-44.9	93.1
	911217	4993.9	16.80	-50.1	
	911218	4992.3	20.61	-59.4	
	921217	4989.9	25.65	-68.8	
	921218	4989.4	26.35	-69.6	
	921219	4990.2	24.21	-63.9	
	931204	4994.4	48.38	-79.1	
[OIII] 4959	800825	5102.4	1.79	-4.0	19.5
	801211	5104.3	1.35	-2.8	12.7
	801212	5105.9	0.99	-2.0	11.1
	811223	5104.3	1.18	-3.4	11.8
	831208	5104.6	1.14	-2.7	11.3
	841225	5105.1	0.77	-1.7	13.3
	851214	5101.5	0.92	-2.6	12.7
	891229	5103.1	0.76	-2.5	9.5
	891230	5103.9	1.71	-5.1	13.3
	901217	5105.6	0.79	-2.1	11.2
	911217	5098.5	1.88	-5.3	3.7
	911218	5100.6	1.96	-5.5	
	921217	5100.2	1.22	-2.9	14.5
	921218	5102.7	1.37	-3.3	11.1
	921219	5103.8	1.64	-4.0	11.8
	931204	5104.4	1.47	-2.3	11.4
[OIII] 5007	791218	5152.4	2.68	-7.7	12.7
	800825	5151.2	4.31	-9.7	14.7
	801211	5151.8	3.61	-7.7	11.5
	801212	5152.9	3.47	-7.4	11.2
	811223	5152.6	4.12	-12.3	12.2
	831208	5153.0	3.42	-8.2	11.8
	841225	5153.1	3.09	-7.1	11.0
	851214	5152.0	2.64	-7.7	10.7
	891229	5151.2	3.09	-10.4	15.0
	891230	5153.0	2.64	-7.5	8.3
	901217	5153.1	3.32	-9.3	11.7
	911217	5152.8	3.19	-9.2	9.3
	911218	5152.1	4.70	-13.4	
	921217	5152.3	3.21	-7.9	9.4
	921218	5152.2	3.75	-9.4	9.0
	921219	5152.6	3.58	-9.1	8.8
	931204	5152.1	3.50	-5.5	9.6

Table 20. Emission line data of NGC 7603 (continued)

Line λ_{rest} Å	Date yyymmdd	λ_{obs} Å	Flux 10^{-14} $\text{erg s}^{-1}\text{cm}^{-2}$	EW Å	FWHM Å
[NII] 5198.5	801211	5352.8	0.42	-0.9	7.9
HeI 5875.6	911218	6037.6	5.80	-17.6	
	921217	6039.5	6.26	-20.2	
	921218	6052.2	6.37	-21.3	
	921219	6040.7	4.97	-17.0	
	931204	6044.0	12.68	-26.7	120.5
[OI] 6300.2	800825	6486.2	1.65	-3.0	15.9
	801212	6482.6	1.30	-2.9	15.1
	811224	6486.5	0.67	-2.4	17.6
	901217	6483.1	1.24	-4.5	
	911217	6484.2	0.65	-2.1	
	911218	6486.7	0.87	-2.5	
	921217	6486.7	0.62	-2.0	8.8
	921218	6487.8	0.81	-2.9	10.4
	921219	6488.9	0.77	-2.8	8.5
	931204	6485.7	0.65	-1.4	
H α 6562.8	791218	6738.7	39.81	-124.7	99.8
	800825	6742.7	126.20	-217.5	113.2
	801212	6740.8	69.04	-130.6	
	811224	6744.0	49.45	-155.3	
	851216	6741.9	87.29	-178.8	
	891231	6740.7	67.81	-211.1	
	901217	6744.4	66.22	-211.0	
	911217	6743.1	81.51	-241.6	
	911218	6742.5	101.90	-277.8	
	921217	6742.0	100.90	-301.0	
	921218	6742.0	86.41	-295.8	
	921219	6743.1	86.01	-302.2	
	931204	6742.8	165.00	-334.3	
[SII] 6717.0, 6731.3	800825	6923.0	5.63	-9.2	25.1
	801212	6920.6	3.83	-9.2	
	811224	6922.1	2.26	-9.4	
	851216	6919.3	2.96	-7.1	
	911217	6921.3	2.51	-9.6	
	911218	6921.7	2.24	-7.5	
	921217	6921.3	2.09	-7.7	
	921218	6922.5	1.86	-7.7	
	921219	6922.1	1.72	-7.4	
	931204	6922.0	2.30	-5.4	

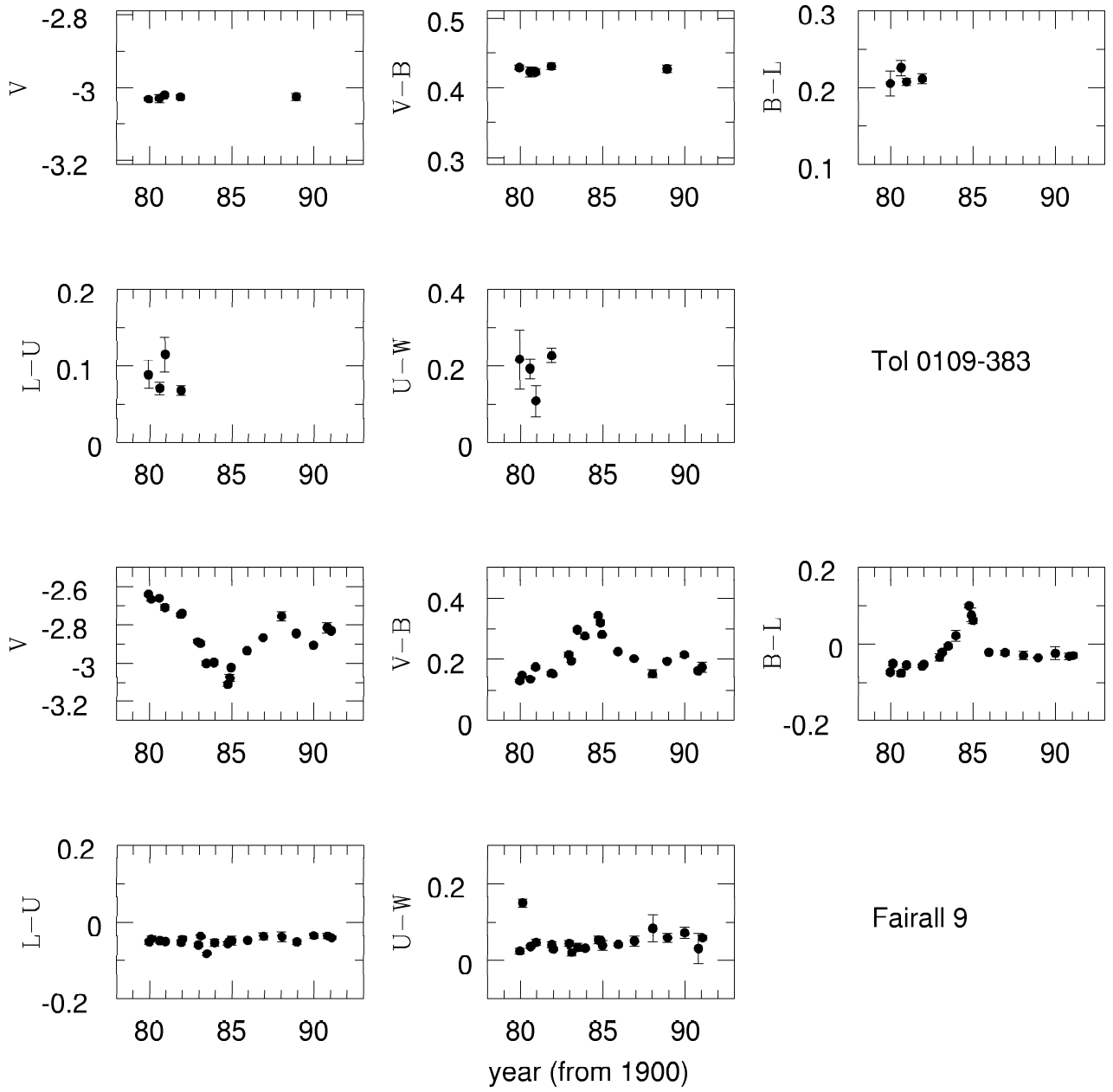


Fig. 3. Light curves of V and colour indices $V - B$, $B - L$, $L - U$ and $U - W$

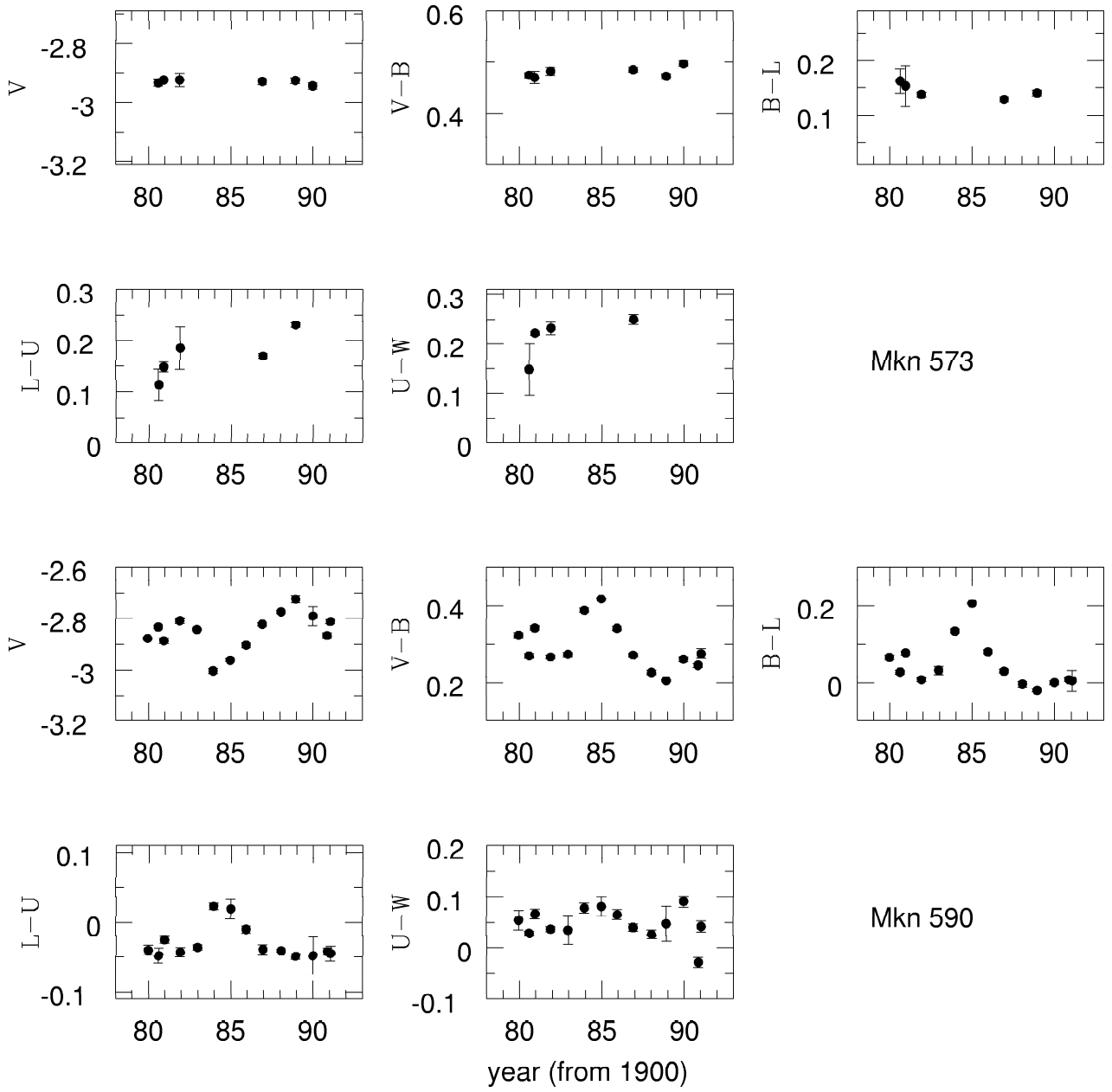


Fig. 4. Light curves of V and colour indices $V - B$, $B - L$, $L - U$ and $U - W$ (continued)

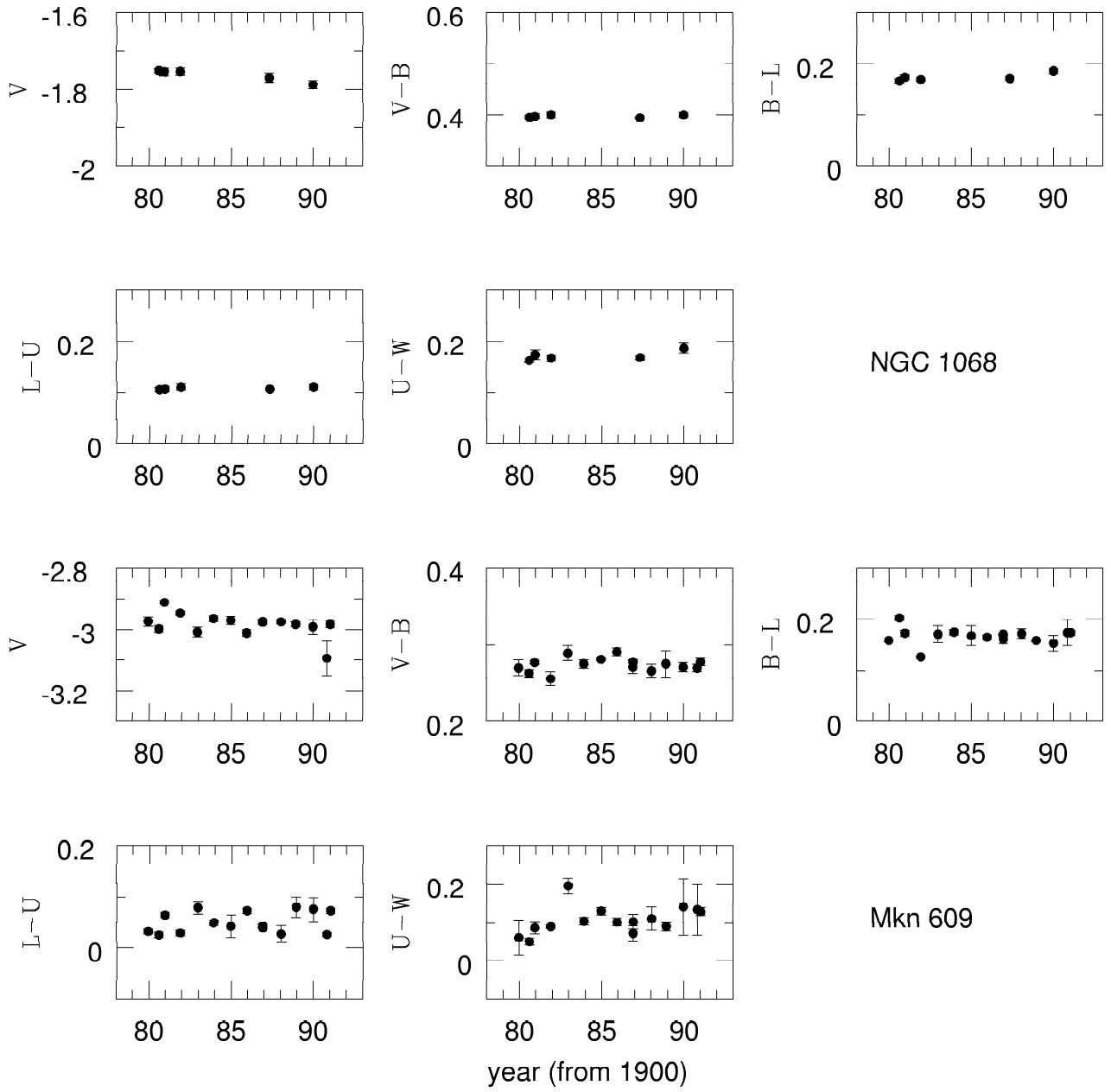


Fig. 5. Light curves of V and colour indices $V-B$, $B-L$, $L-U$ and $U-W$ (continued)

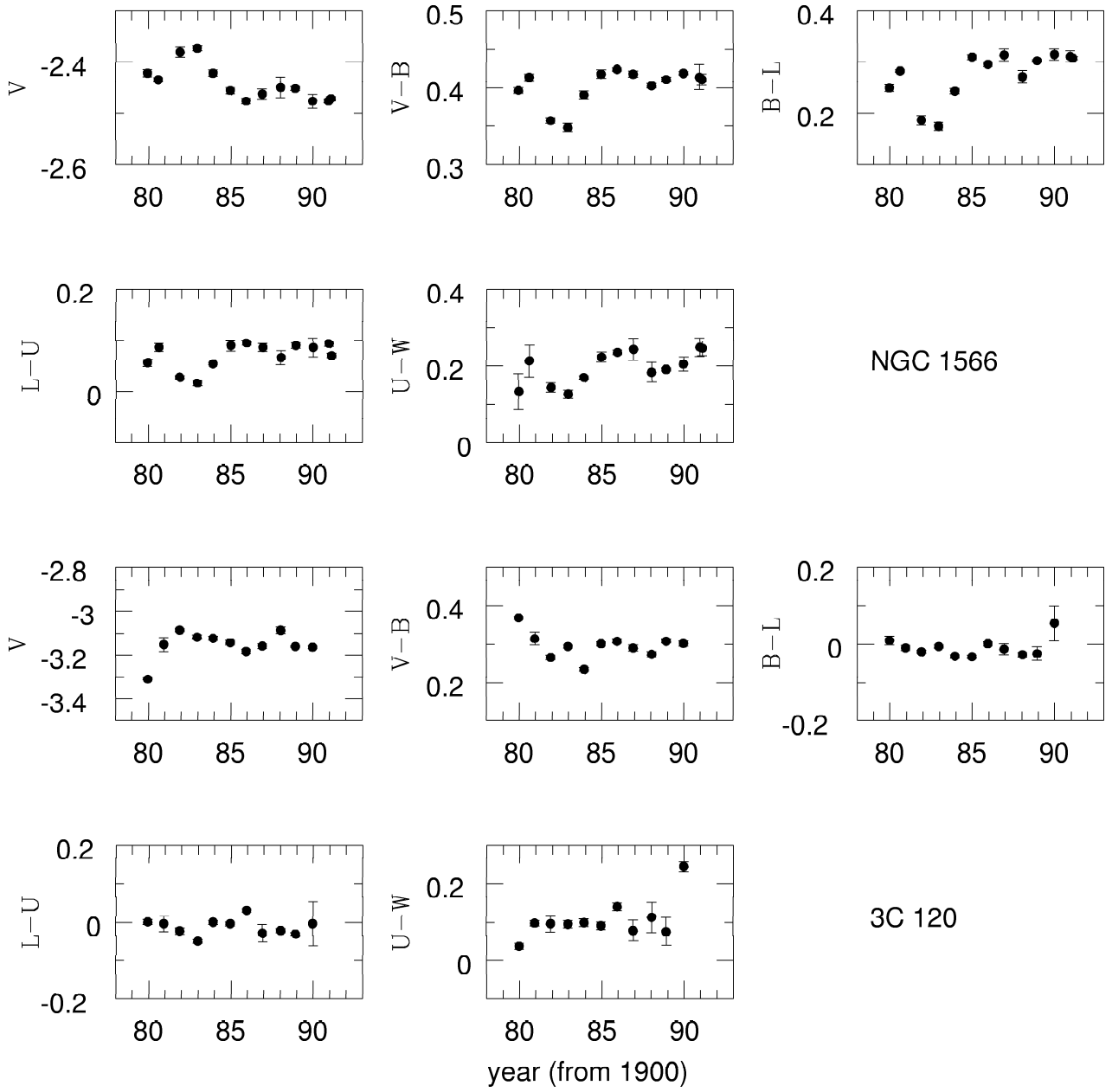


Fig. 6. Light curves of V and colour indices $V - B$, $B - L$, $L - U$ and $U - W$ (continued)

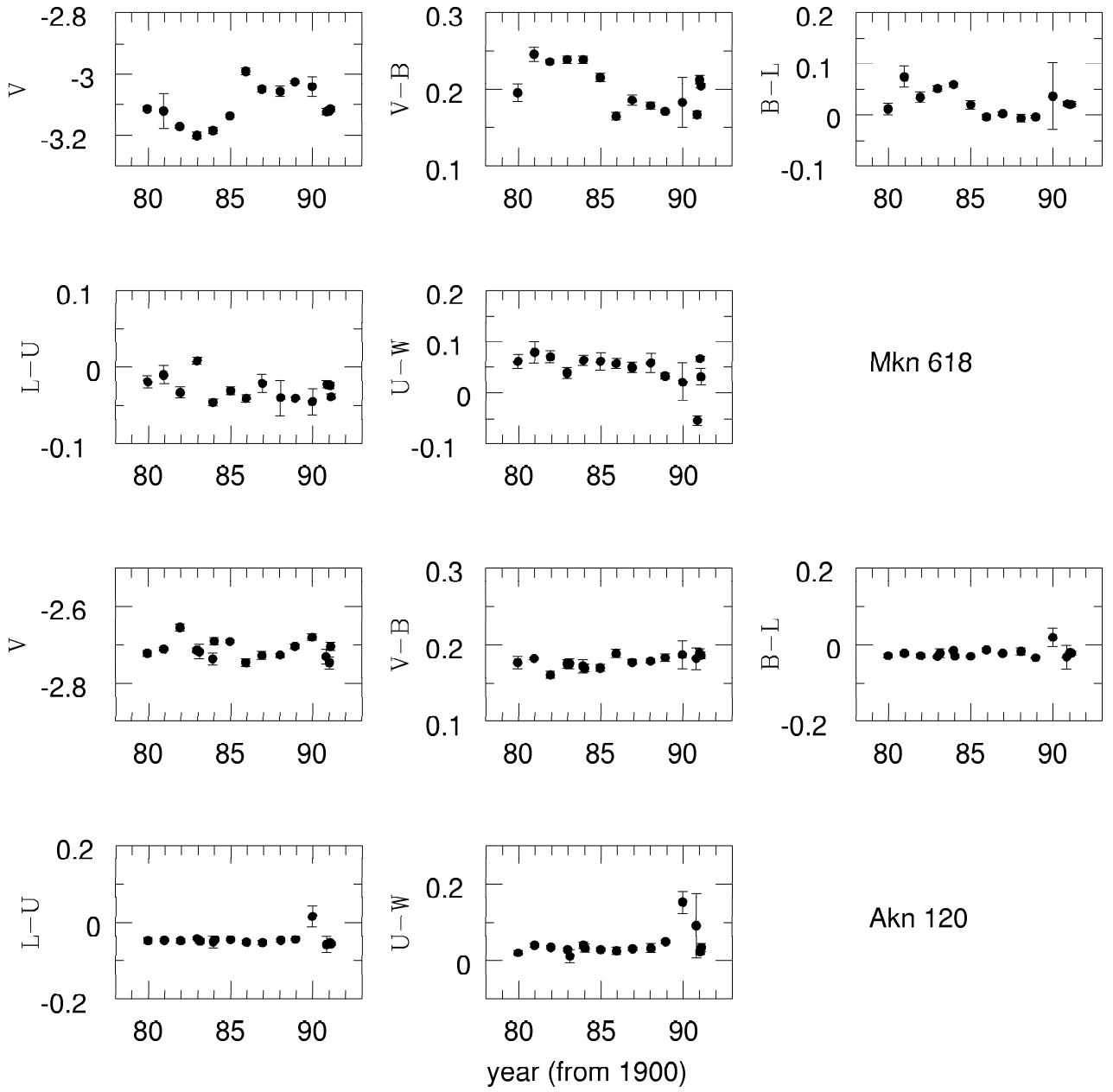


Fig. 7. Light curves of V and colour indices $V - B$, $B - L$, $L - U$ and $U - W$ (continued)

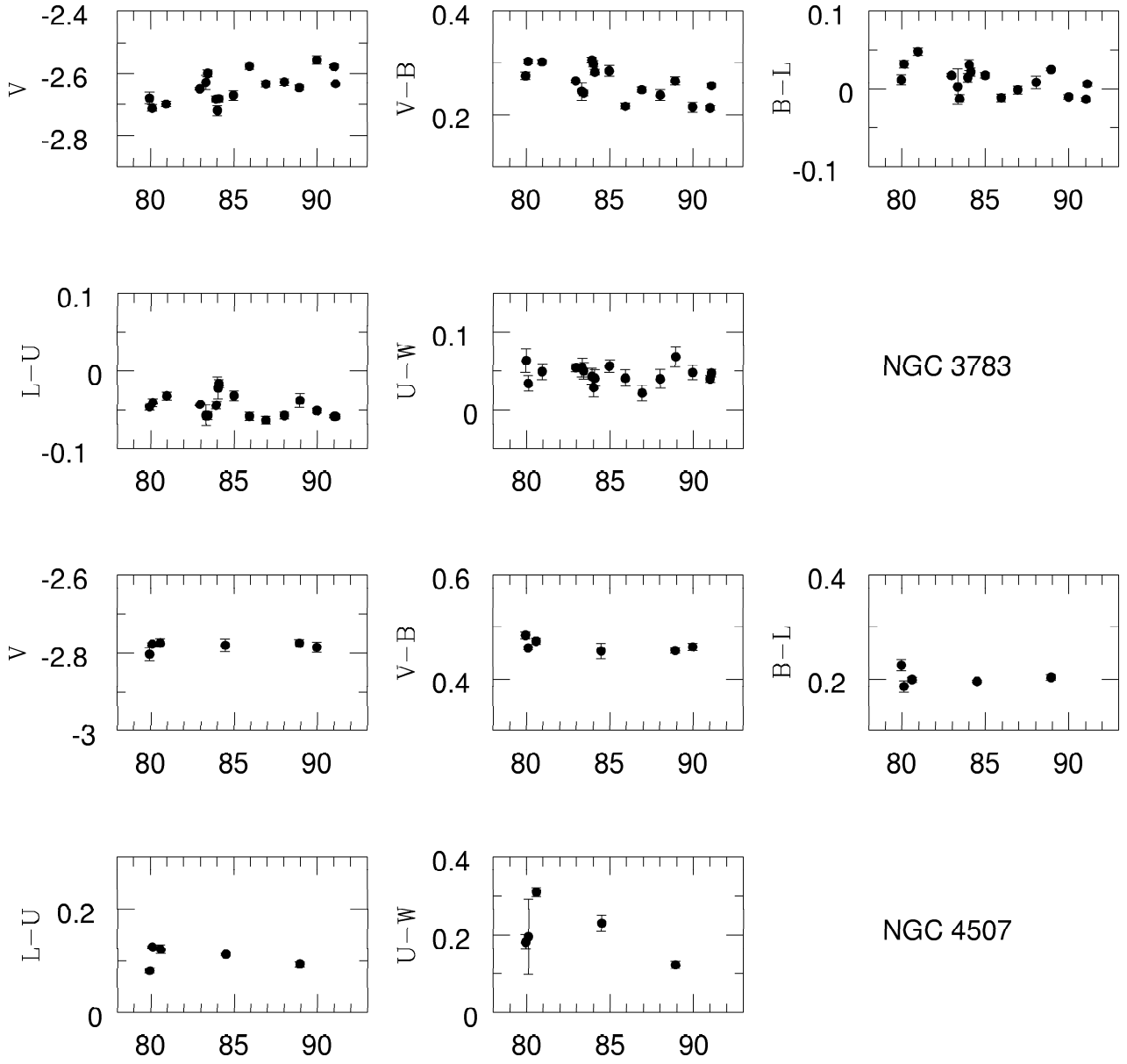


Fig. 8. Light curves of V and colour indices $V-B$, $B-L$, $L-U$ and $U-W$ (continued)

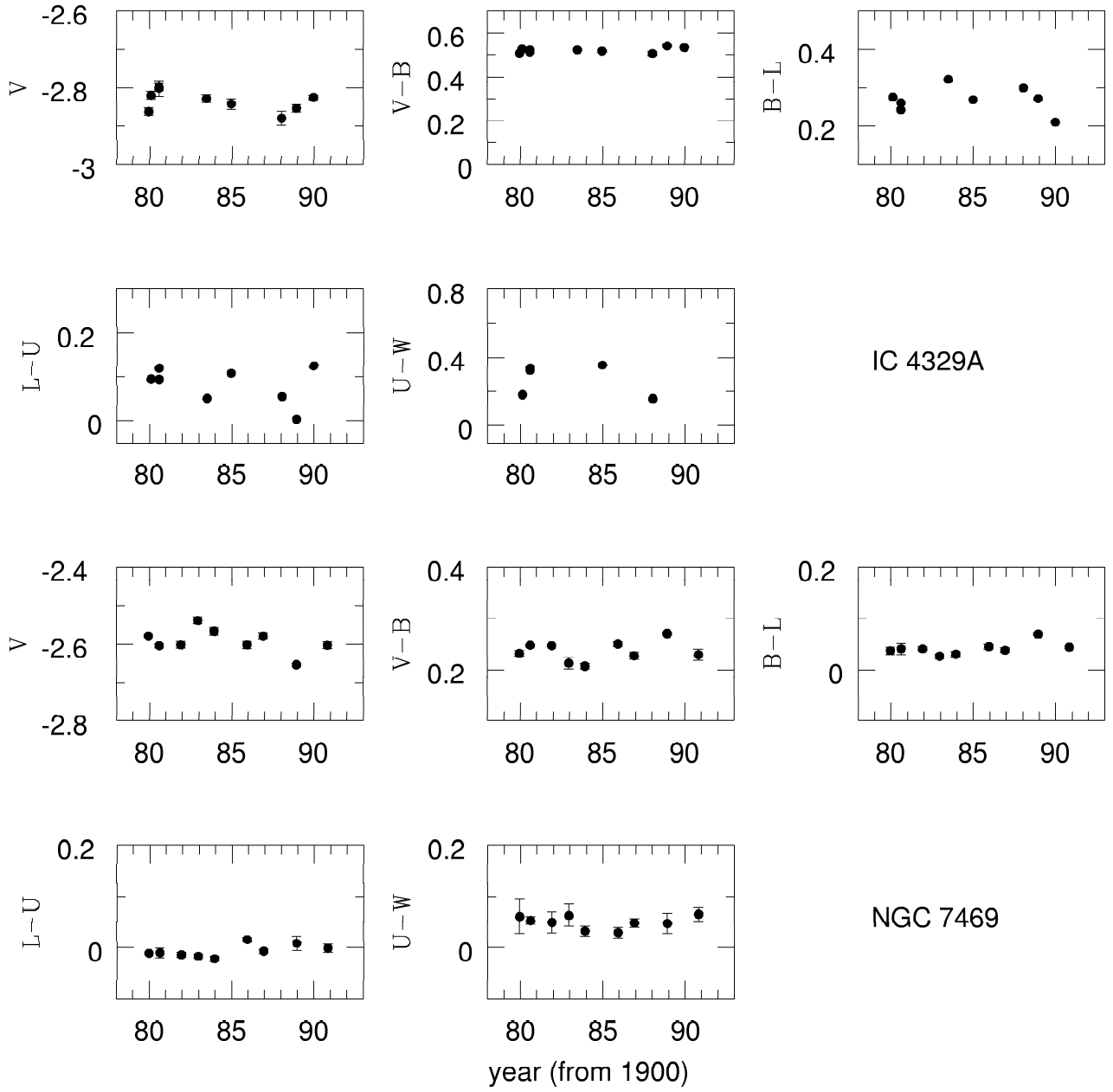


Fig. 9. Light curves of V and colour indices $V - B$, $B - L$, $L - U$ and $U - W$ (continued)

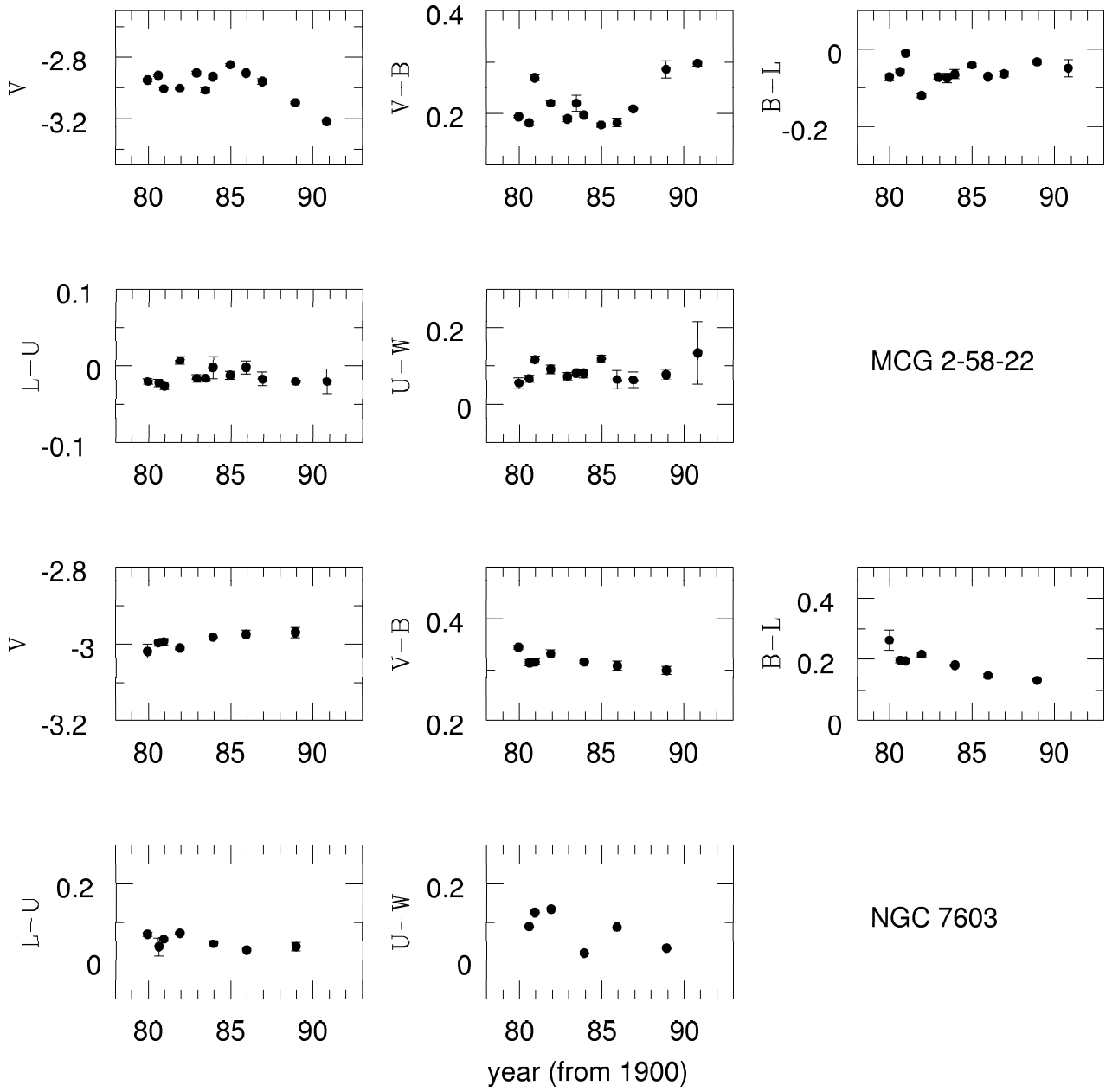


Fig. 10. Light curves of V and colour indices $V-B$, $B-L$, $L-U$ and $U-W$ (continued)

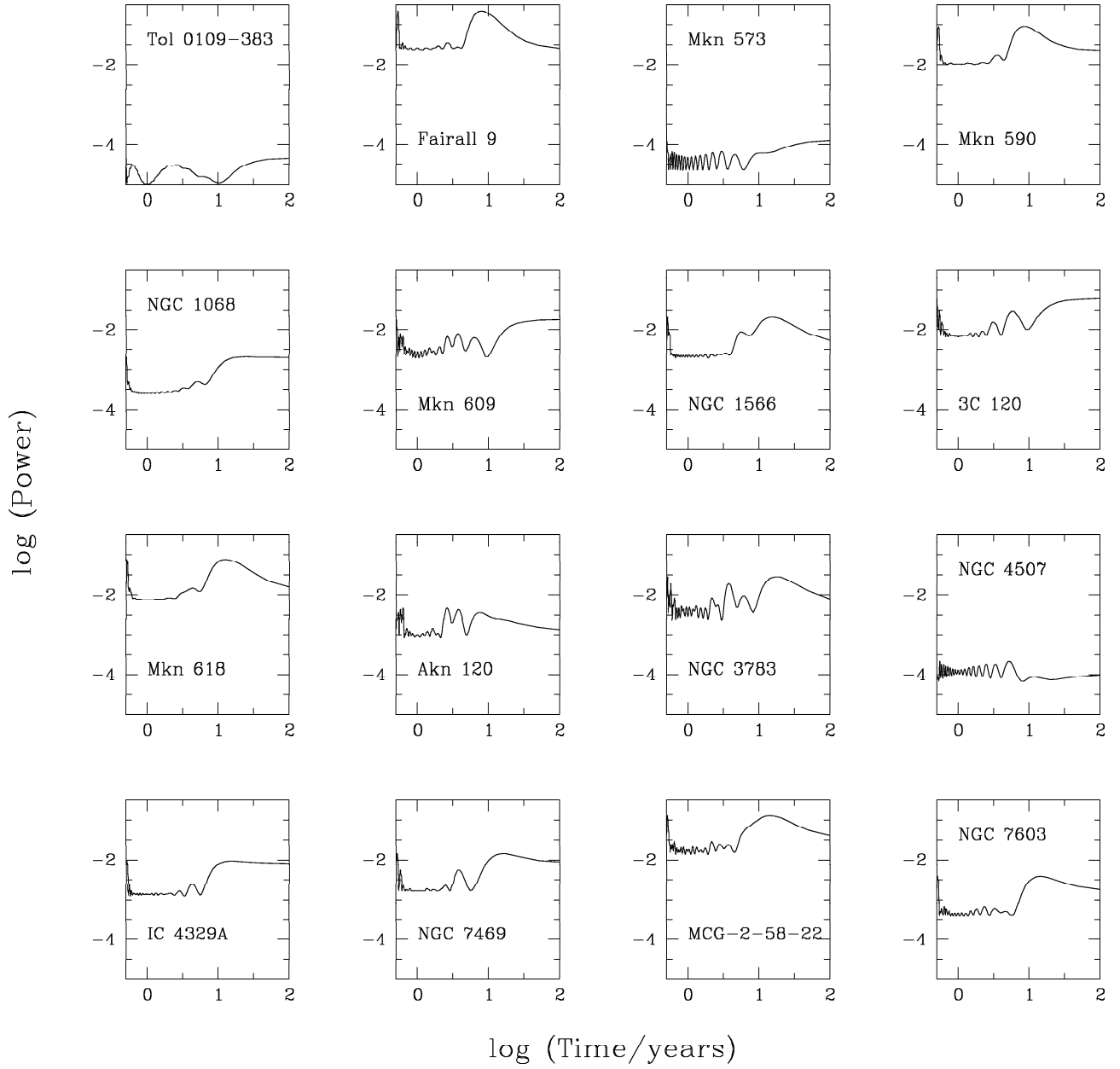
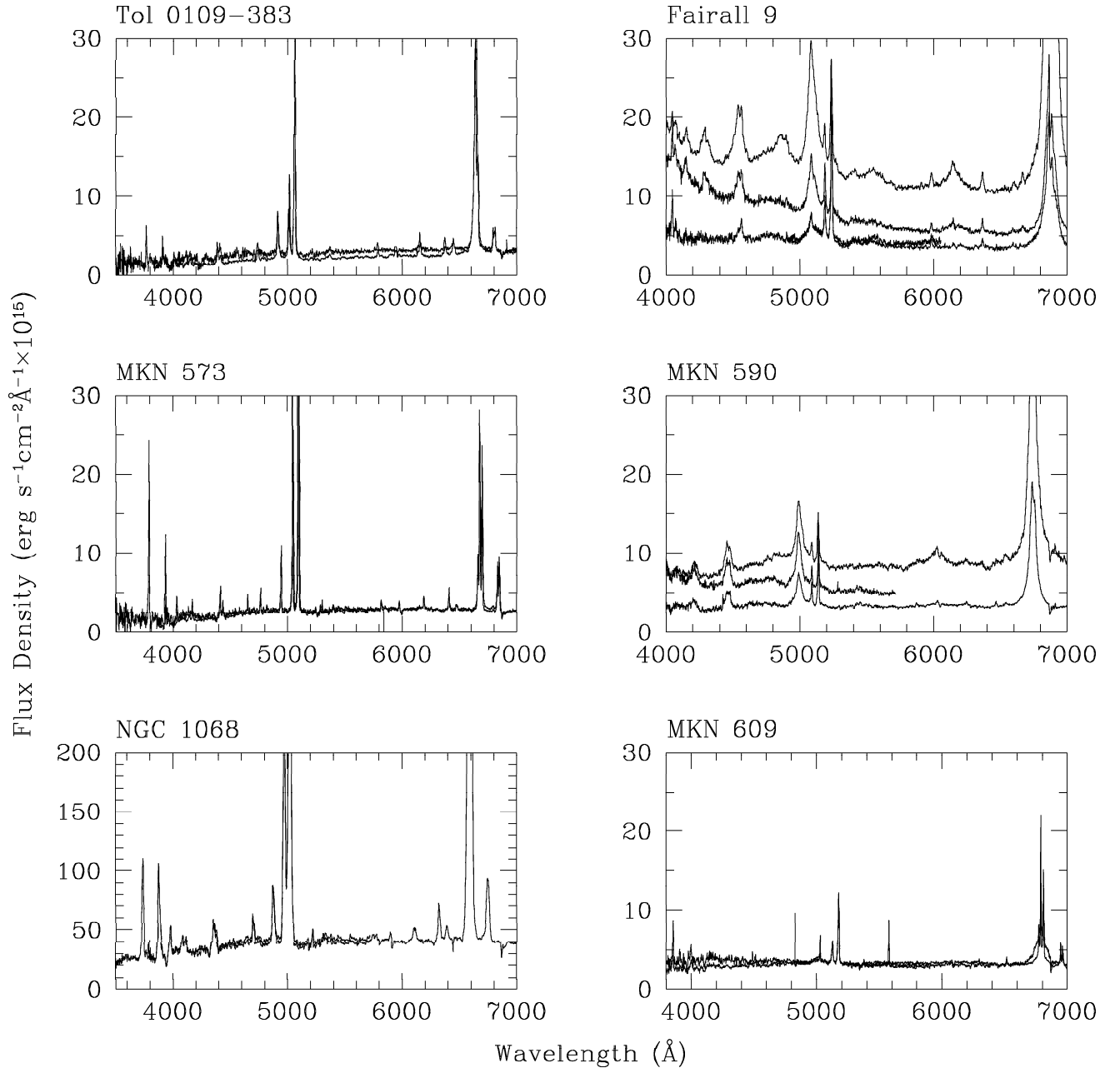
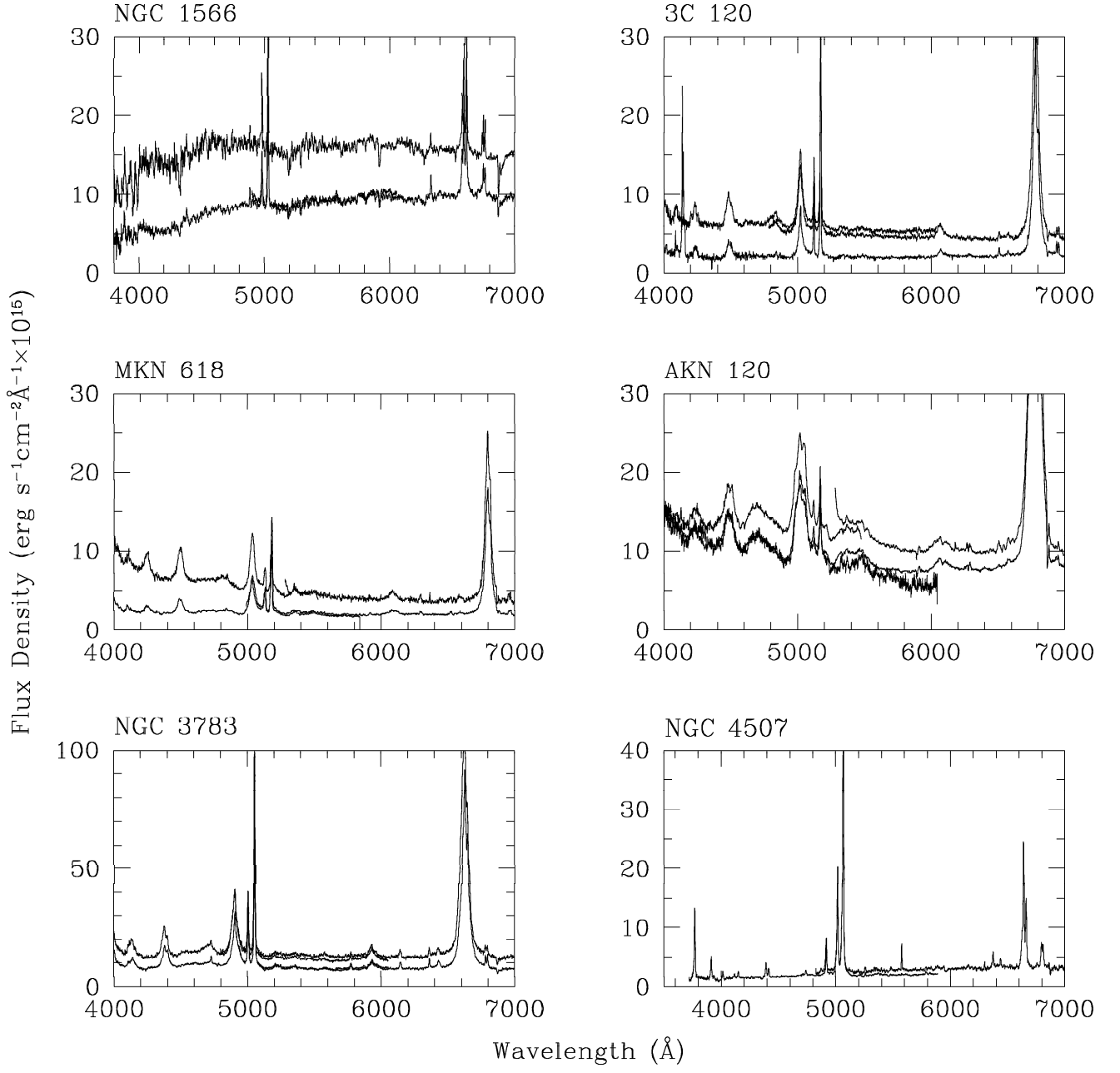


Fig. 11. Power spectra of the V light curves

**Fig. 12.** High and low state spectra

**Fig. 13.** High and low state spectra (continued)

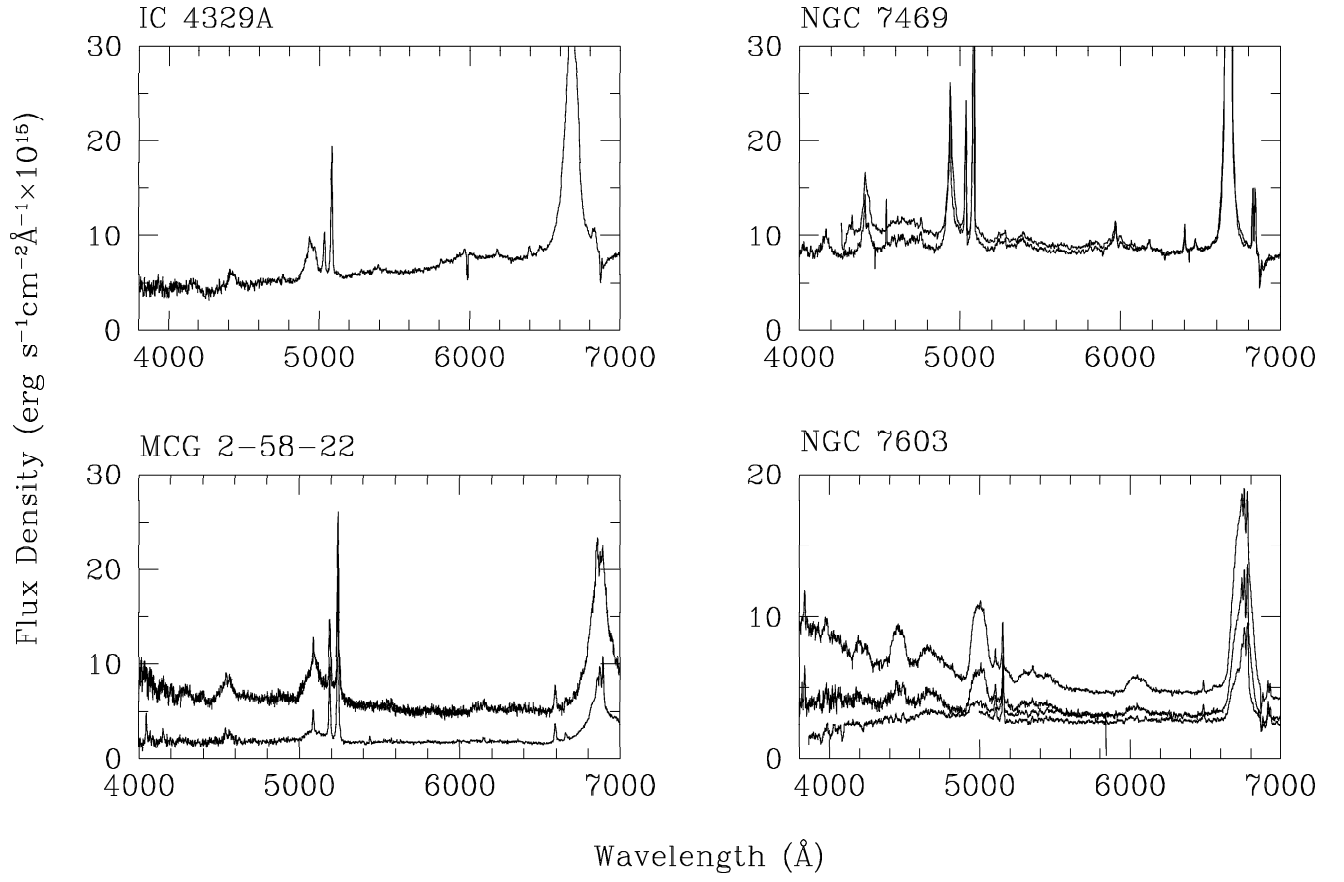


Fig. 14. High and low state spectra (continued)