THE SPECTRA OF COMETS 1948 I, 1948 IV, 1955 e AND 1955 f

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In the past years several spectra of comets have been obtained at the Observatory of the German Academy of Sciences at Sonneberg. The spectra were taken with an objective prism (⌀ 135 mm, $\varphi = 7°$) attached to the small Zeiss astrograph (Triplet f/5, ⌀ 140 mm, f = 700 mm) by P. Ahnert, N. B. Richter, and W. Wenzel. The dispersion of this instrument was 240 A/mm at λ 4000. The plates were measured by the author with the Görisch microphotometer. All the microphotometer tracings of spectra were reduced to have the equal intensity in the region $\lambda\lambda$ 4000—4500.

Спектры комет 1948 I, 1948 IV, 1955 e и 1955f. В течение последних лет в астрономической обсерватории в Зоннеберге был собран ряд спектров комет. Спектры были экспонированы с помощью малого астрографа Цейса (Triplet 1 : 5, ⌀ 140 мм, f = 700 мм), снабженного объективной призмой (⌀ 135 мм, $\varphi = 7°$). Рассеяние прибора равнялось 240 А/мм у λ 4000. Спектры были замерены микрофотометром, а регистрированные кривые были приведены к одной и той же интенсивности в диапазоне $\lambda\lambda$ 4000—4500. На фиг. 1 была приведена регистрирующая кривая спектра кометы 1948 I (Bester), на фиг. 2—6 — спектры кометы 1948 IV (Honda-Bernasconi), на фиг. 7 — спектры кометы 1955 e (Mrkos) и на фиг. 8—9 — спектры кометы 1955 f (Bacharev-Macfarlane-Krienke).

Comet 1948 I (Bester)

Two spectra of comet 1948 I were obtained on March 23, 1948, and March 29. For both spectra Agfa Astro Rot plates were used. Exposure of the first plate (March 23) was 21 minutes and the spectrum was very weak. This spectrum shows several of the most intensive bands [CN(0·0), C_2(1·0), C_2(0·2)] only. Exposure of the second spectrum (March 29) was 45 minutes. The heliocentric distance of the comet was $r = 1{\cdot}1$ astronomical units.

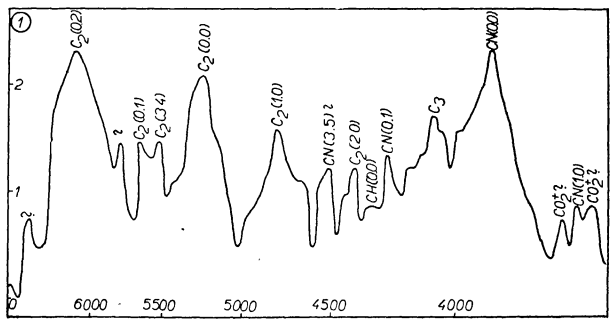

Fig. 1. Comet 1948 I. March 29, 1948 (Agfa Astro Rot)

The microphotometer tracing of the second spectrum is shown by Fig. 1. The reflected solar spectrum was relatively intensive. Of the emissions the (0·0) band of CN is of fair intensity, other bands of CN [(1·0), (0·1), (3·5)?] are relatively weak. The Swan bands are very strong [excepting the (1·0)], especially in the long-wave region [(0·0), (0·2)]. The λ 4050 emission of C_3 is rather strong. Of other emissions the bands of CH, further probably CO_2^+ (tail?) and two unidentified emissions near $\lambda\lambda$ 5730 and 6500 are present.

Comet 1948 IV (Honda-Bernasconi)

Five spectra of the comet 1948 IV have been obtained. Fig. 2 shows the microphotometer tracing of June 9, 1948 (exposure ~90 min.), Fig. 3 of June 10 (exp. ~90 min.), Fig. 4 also of June 10 (exp. 86 min.), Fig. 5 of June 13 (exp. 107 min.) and Fig. 6 of June 14 (exp. 85 min.). The spectrum 2 was taken on Agfa Isochrom plate, spectrum 3 on Agfa ISS plate, spectra 4, 5, and 6 on Kranz Ultra plates. The heliocentric distance of the comet during the period of observation was about 0·8 AU.

The microphotometer tracing 2 shows a relatively weak continuous spectrum. The CN bands are weak, especially the (0·0). Very bright is the (2·0) and especially the (1·0) band of C_2. Unusually strong are the unidentified emissions between $\lambda\lambda$ 4800 and 5000. The λ 4050 band of C_3 is faint. Further, two unidentified emissions near $\lambda\lambda$ 5350 and 5730 are present.

Spectrum 3 shows only six emissions in addition to a relatively strong continuous spectrum. The (0·0) band of CN and the Swan bands [especially C_2 (1·0) and (2·0)] are strong. The emission λ 4050 is rather bright.

Spectrogram 4 shows a strong continuum. There appear more emissions than in spectrum 3, taken at the same day. The (0·0) band of CN and the (1·0) band of C_2 are very strong. Also other Swan bands [(0·0), (2·3), (0·2)] are rather bright. The λ 4050 emission of C_3 is very weak. Further several unidentified bands near $\lambda\lambda$ 4450, 5000, and 5730, and probably one emission of CO^+ (tail?) are present.

In spectrum 5 the (0·0) band of CN is stronger than in spectrum 4. Also the emission λ 4050 of C_3 is brighter. The Swan bands are weaker than in spectrum 4. There also occur a weak (0·0) band of CH. Reflected solar spectrum is bright.

In microphotometer tracing 6 the CN bands are rather bright, the (0·0) band of CN is very strong. Of the Swan system the (1·0) band is very bright, the (2·0), (0·0), and (2·3) bands fairly strong. There also occur the emissions C_3 ($\lambda\lambda$ 4010, 4050), CN [(0·1), (1·2), (1·0)], probably also CO^+, CO_2^+ (tail?) and several unidentified bands near $\lambda\lambda$ 3495, 3800, 4480, 5000, and 5730. Reflected solar spectrum is relatively strong.

Comet 1955 e (Mrkos)

The spectrogram 7 was obtained on July 16, 1955 (exp. 90 min.) on an Agfa Astro plate. The spectrum was very faint. The heliocentric distance of the comet was 1·1 AU. The microphotometer tracing shows about 25 emissions. Extremely strong are the (0·0) and (1·0) bands of CN and also other emissions of CN are strong. The system

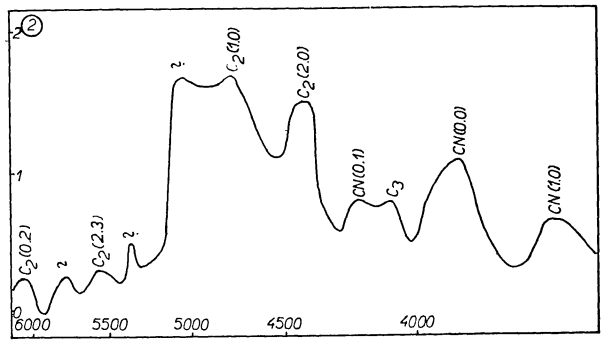

Fig. 2. Comet 1948 IV. June 9, 1948 (Agfa Isochrom)

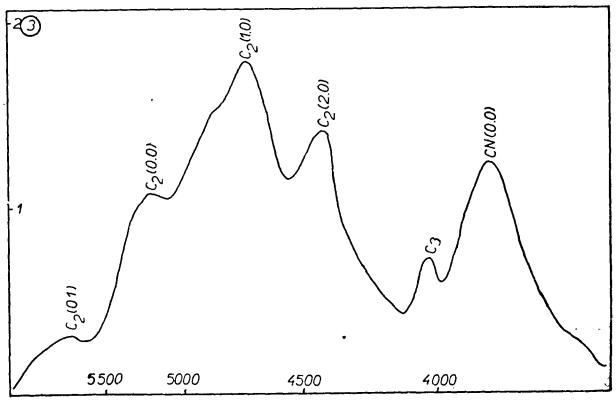

Fig. 3. Comet 1948 IV. June 10, 1948 (Agfa ISS)

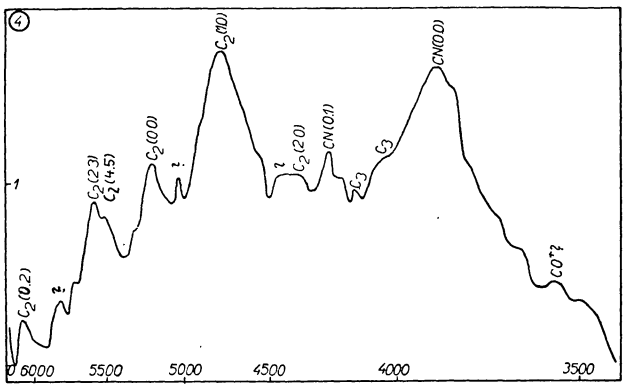

Fig. 4. Comet 1948 IV. June 10, 1948 (Kranz Ultra)

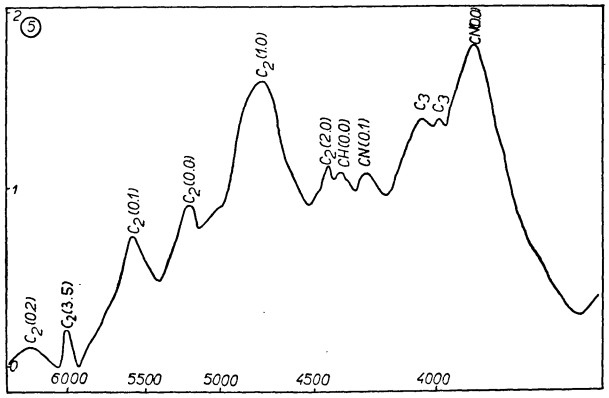

Fig. 5. Comet 1948 IV. June 13, 1948 (Kranz Ultra)

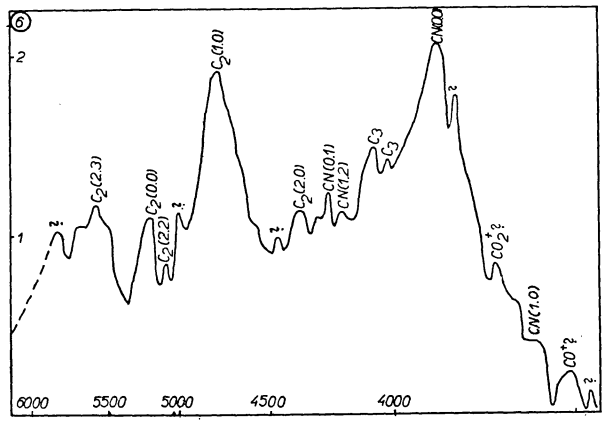

Fig. 6. Comet 1948 IV. June 14, 1948 (Kranz Ultra)

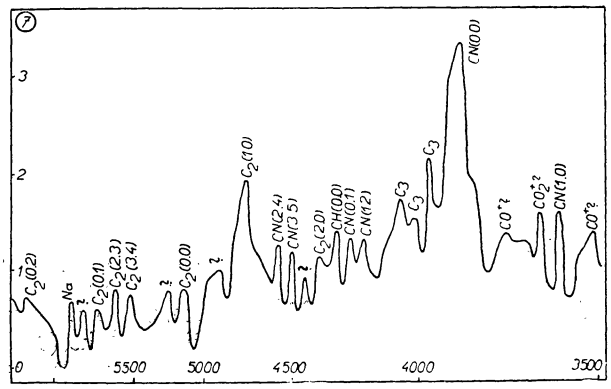

Fig. 7. Comet 1955 e. July 16, 1955 (Agfa Astro)

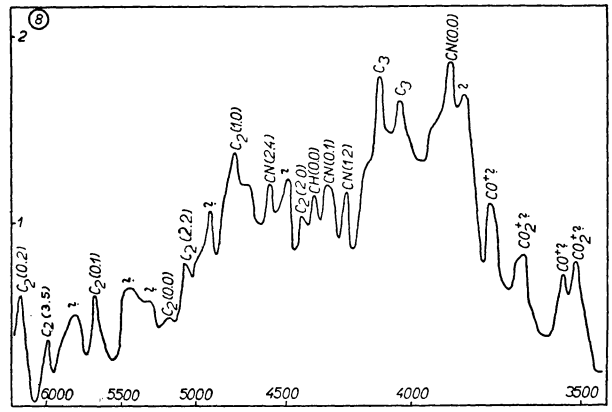

Fig. 8. Comet 1955 f. July 17, 1955 (Agfa Astro)

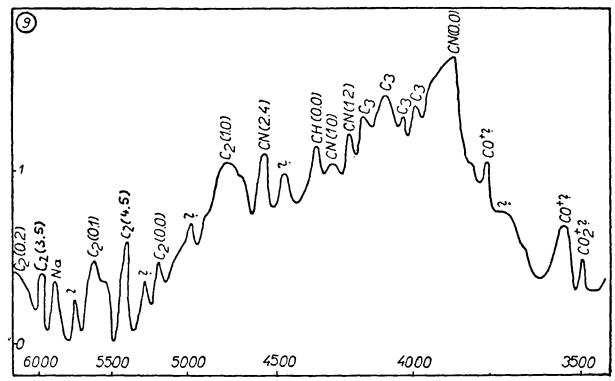

Fig. 9. Comet 1955 f. July 23, 1955 (Agfa Astro)