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PRESENT ACTIVITY OF CH CYGNI

The last activity phase of the semiregular variable star CH Cyg began in May 1977. High resolution spectra (12.4 Å/mm) have been obtained regularly at the Haute Provence Observatory since September 1977. The evolution of the present outburst is remarkably slower and quite different from the previous one of 1967-1970. In the blue region the normal absorption line spectrum has been continuously weakening because of the presence of a hot continuum filling up the lines; almost no M6 lines have been detectable since 1979. The spectrum is dominated by strong emission features mainly due to Fe II and [Fe II] and by a very well-developed Balmer series. A report on the results obtained from these spectra during the first two years of activity has been published by Faraggiana (1980).

Since then the main variations observed up to September 1980 are:

1) The Balmer series shows a much sharper absorption component and lines are visible on the last spectra up to H_{38}.
2) The He I emission lines are steadily weakening.
3) The Ti II lines which had a P Cyg profile until 1979 are now present as red-winged emission lines.
4) The Fe II emission lines which had a violet-winged profile until 1978 now show a red-winged profile.
5) The [Fe II] emission lines are developing a much sharper profile in comparison with the permitted Fe II lines.
6) New emissions are developing, e.g. Na I and Sr II resonance lines.
7) The [O III] 5007 and 4363 present during the 1967-70 outburst

are not present during the present burst, but [O I] 6300 and 6363 and [O II] 3727 have been present with increasing intensity since 1978.

Low resolution observations of the far ultraviolet spectrum have been obtained with IUE on April 22, 1978, July 31, 1978, March 11, 1979, September 22, 1979 and September 1, 1980 by Hack, Morossi and Selvelli. In the first two epochs the observations were made with the small aperture, which transmits an unknown fraction, varying between one half to one tenth of the incident radiation, according to the accuracy by which the stellar image is centred on the 3" hole. Hence the absolute flux at these two epochs is larger than the observed value by a factor which at the most is about 10. All the other observations were made with the large aperture. The fluxes at four wavelengths are given in Table I. The energy distribution has remained practically the same, except in September 1980, when the relative intensity at $\lambda<1300$ is smaller than at the previous epochs. The flux,however,

Table I

Date	λ	Flux at the Earth (erg $cm^{-2}s^{-1}A^{-1}$)
Apr. 22, 1978 (small aperture)	1200	$3.2\ 10^{-14}<F\leq 3.2\ 10^{-13}$
	1380	$1.2\ 10^{-13}$ $1.2\ 10^{-12}$
	1500	$1.8\ 10^{-13}$ $1.8\ 10^{-12}$
	1800	$2.8\ 10^{-13}$ $2.8\ 10^{-12}$
July 31, 1978 (small aperture)	1200	$2.0\ 10^{-13}$ $2.0\ 10^{-12}$
	1380	$4.0\ 10^{-13}$ $4.0\ 10^{-12}$
	1500	$6.3\ 10^{-13}$ $6.3\ 10^{-12}$
	1800	$1.1\ 10^{-12}$ $1.1\ 10^{-11}$
March 11, 1979 (large aperture)	1200	$4.6\ 10^{-13}$
	1380	$7.9\ 10^{-13}$
	1500	$1.1\ 10^{-12}$
	1800	$2.7\ 10^{-12}$: (overexposed)
Sept. 22, 1979 (large aperture)	1200	$1.5\ 10^{-10}$
	1380	$4.3\ 10^{-10}$
	1500	$6.9\ 10^{-10}$
	1800	$1.2\ 10^{-9}$
Sept. 1, 1980 (large aperture)	1200	$2.4\ 10^{-10}$
	1380	$1.3\ 10^{-9}$
	1500	$2.1\ 10^{-9}$
	1800	$3.8\ 10^{-9}$

increased from March 1979 to September 1979 by 6.5 magnitudes, while visual observations (Henshaw, 1979, 1980) for the period December 1977 to December 1979 indicate that V oscillates be-

tween 6.4 and 7.4. In September 1980 the ultraviolet flux has further increased relatively to the flux observed one year before by a factor of 3 in the range 1300 -2000 Å and by a factor of 1.6 in the range 1200 -1300 Å. No photometric observations of the visual magnitude have been published for this date but the spectroscopic observations made by Faraggiana at the Haute Provence Observatory at the end of September suggest that also the visual and photographic magnitudes are much brighter than the average magnitude of CH Cyg, because of the much shorter exposure time needed for obtaining well-exposed spectrograms at 12.4 Å/mm and the possibility of obtaining for the first time a spectrogram at 7 Å/mm.

The complexity of the observed phenomena (e.g. the striking presence simultaneously of P Cyg (Ca II lines) and inverse P Cyg (Balmer series) profiles) and the evidence that the observed peculiarities are not reproduced during subsequent outbursts imply the necessity to combine spectroscopic and photometric observations extended over the largest wavelength region attainable.

The two different classes of models for the symbiotic stars (single or double star) have been applied to CH Cyg by several authors but the observed peculiarities do not make it possible to discriminate between the two models.

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