POLARIMETRY OF CH CYGNI

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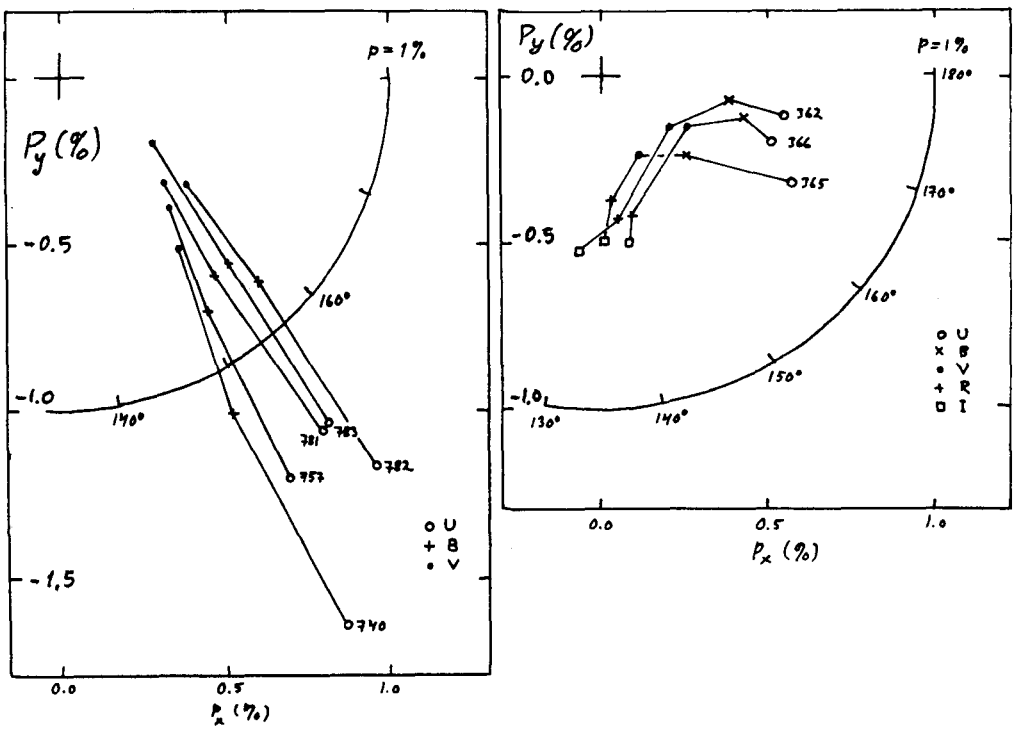

Figure 1. Polarization observations of CH Cyg in the autumn 1978 (left) and in May 1980 plotted in polar coordinates. The numbers in the figures give the last three digits of Julian Date.

Variable linear polarization has been detected in CH Cyg. Observations in 1977–79 (UBV) and 1979–80 (UBVRI) are presented. The amount of polarisation increases towards ultraviolet and the observed values range from 0.34 to 1.85 % in the ultraviolet, and 0.04 to 0.68 % in the yellow

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light. In the red and infrared observations the polarizationwas typically less than 0.1 %. During the interval September 1977 - February 1978 and in May 1980 a second component of polarization, with different direction and wavelength dependence, was present, resulting in a strong rotation of the position angle as a function of wavelength. The R and I observations of May 1980 ($P_R \cong 0.4$ %, $P_I \cong 0.5$%) showed that the second component was increasing towards the infrared. The peculiar wavelength dependence of polarization and position angle could be explained by variations in particle size and scattering geometry in a complicated dust envelope around the M giant. Another hypothesis is that the component of polarization increasing towards the ultraviolet is produced by electron scattering in an extended envelope of a hot companion and the second component by transient dust envelope of the M giant.

DISCUSSION ON CH CYGNI

Plavec: What is the shape on the UV continuum?

Hack: In 1978 and 1979 it was almost flat from 1240 to 1700 A. At 1700 A there is a sudden increase of flux, and then a slow increase from 1725 to 2200 A. In September 1980 the overall flux was about 8 times larger than that of 1978. In 1978 and 1979 the shape was about the same. We have no good data for the near ultraviolet continuum.

Friedjung: Can you give an upper limit to possible orbital radial velocity variations of the red component?

Hack: The radial velocity given by the photospheric line (neutral elements and TiO bands) fluctuates between -55 and -60 km s^{-1}. We do not have a continuous sequence of observations permitting us to decide between irregular or orbital radial velocity variations.

Houziaux: I would like to ask if other [OI] lines have been observed in addition to the 6300 and 6363 lines. It frequently happens that the red lines are observed while companion lines are absent. It should be noted that from the $2p^4\ ^1S$ level there is a coincidence with Lyα which could pump atoms to an upper level with possible autoionization/dielectronic recombination phenomena.

Hack: The 5577, 6158 and 6456 lines of [OI] have not been observed.

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