VISUAL SYMBIOTIC SPECTRA OBTAINED WITH THE HAUTE PROVENCE MULTIPHOT DETECTOR

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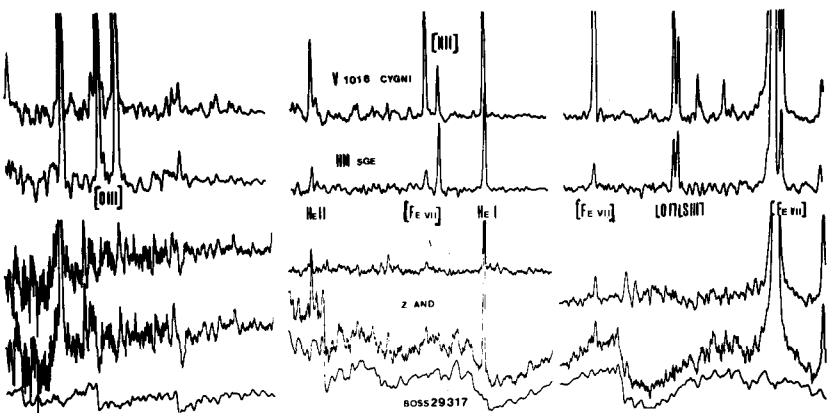
Spectra of symbiotic stars have been obtained with the Haute Provence Multiplhot detector system. This has 512 pixels, so one can study either a large spectral region at low resolution, or a smaller region with a higher resolution.



The figure shows the low resolution spectra of V1016 Cyg, HM Sge and Z And in summer 1980 in three spectral regions: ~4800–5400 A, 5400–6000 A, and 6000–6700 A. The spectrum of Z And (fourth row) is compared with that of the M3III star Boss 29317 (fifth row), with a comparable strength of the TiO bands. By subtraction we obtained the spectrum in the third row.

M. Friedjung and R. Viotti (eds.), The Nature of Symbiotic Stars, 83–84.

DISCUSSION ON OPTICAL OBSERVATIONS

Nussbaumer: May I draw the attention of the visual observers to the value of observations covering the [FeVII] lines. To determine electron temperatures it would be particularly valuable to obtain relative intensities for two lines where one should originate from ^1D (λ6087 or 5721) and the other from ^1G (e.g. λ 3587). For a full list of the visual [FeVII] lines, see for example Nussbaumer and Osterbrock, 1970, Ap. J. 161, 811. The value of comparing these line intensities with the [FeVII] λ2015 line is mentioned in my talk on UV lines.

Kafatos: There is a puzzling fact about the optical line profiles. Why do the optical lines generally show considerable structure (large velocities, multiple components), whereas the UV lines show very little - if any - structure. One would expect intuitively the situation to be exactly opposite to what one sees, because the UV lines presumably come from regions closer to the hot component.

Oliversen: Good question: it seems likely that the H_α emission comes from a more extended region, probably consisting of more than one region. The blue reversal could be due to absorption in the systems by accreting material.

Viotti: Did you find in the symbiotic stars large variations in the H_α line profile, and what is the typical time scale of these variations?

Oliversen: Yes. Often the H_α profile will change from the single 'blue asymmetrical' profile to a profile with a reversal (or emission component) on the blue wing. Typical time scales for this are of the order of months to a few years.
V1016 Cyg has been constant in its H_α profile.

Slovak: We have made observations at H_α separated by a few minutes to hours and have noticed no short time variations.

Swings: Measurements of the line widths of H_α, HeI and [NII] in a series of peculiar emission line objects (Swings and Andrillat, Astr. Astrophys. in press), tend to support the interacting winds theory for the formation of planetary nebulae (see e.g. Kwok, these proceedings).

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