

MULTIAPERTURE SPECTROSCOPY

The CFH focal reducer was modified to work as a multislit spectrograph. The first observational tests were performed in March 1984 by B. Fort and J.P. Picat (Toulouse), G. Lelièvre (CFH) and Y. Rio (CEA) using the CEA-INAG CCD Camera as detector.

A CCD image of the field is obtained with a short exposure (V or R filter, 5 min.). The accurate numerically-coded position of an off-set star is recorded on a guide probe.

The on-line computer displays a negative mask of the field on a plotter. A photograph of the mask is made on Kodalithe orthofilm, type 3. The software adapts to the magnification, corrects residual optical distortion and applies various selection criteria: superposition of spectra, selection of sky reference apertures, ghost image cleaning, magnitude selection ($20.5 < V < 23$), etc.

The mask is then positioned in the focal reducer with a simultaneous video display of field objects images of crosses) and mask apertures (front-side illuminated by a calibration lamp, fig. 1). The true position is obtained in a few minutes when the two images are superimposed, using a microdisplacement Δx , Δy , $\Delta \theta$ of the mask holder.

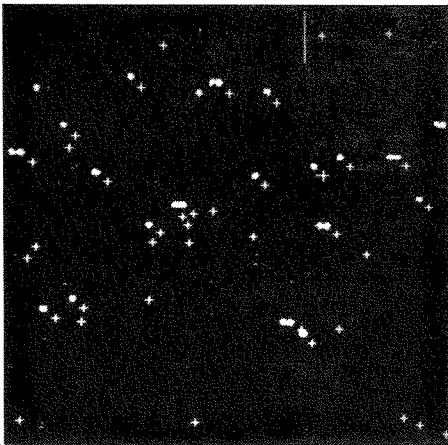


Figure 1

A multiaperture spectroscopic CCD image (fig. 2) is then recorded through a Carpenter prism. Preliminary results indicate the possibility of recording more than 50 spectra at a time, between 4000 and 8500 Å with a spectral resolution of 40 to 8 Å/pixel, and a usable aperture of between 1.5 and 2.5 arc sec; to obtain spectra in the range of $19.5 < V < 22$ typically requires an exposure time of 1 hour.

Fig. 3 shows the reduction of data:

- 1) sky + object
- 2) sky alone in adjacent aperture
- 3) subtraction showing Lyman α and CIV.

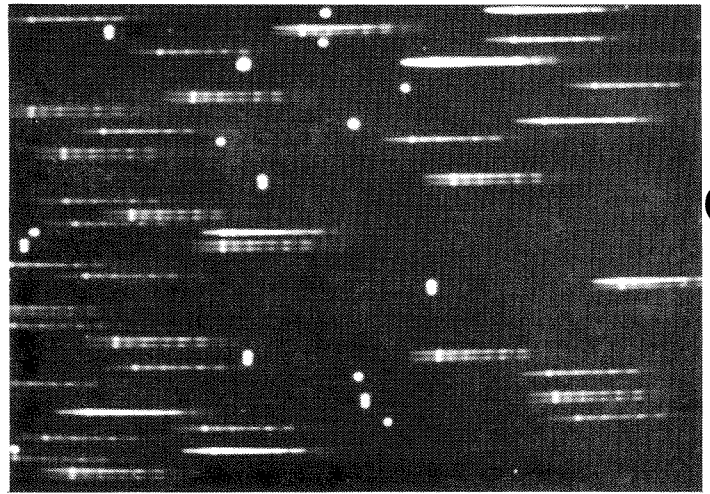


Figure 2

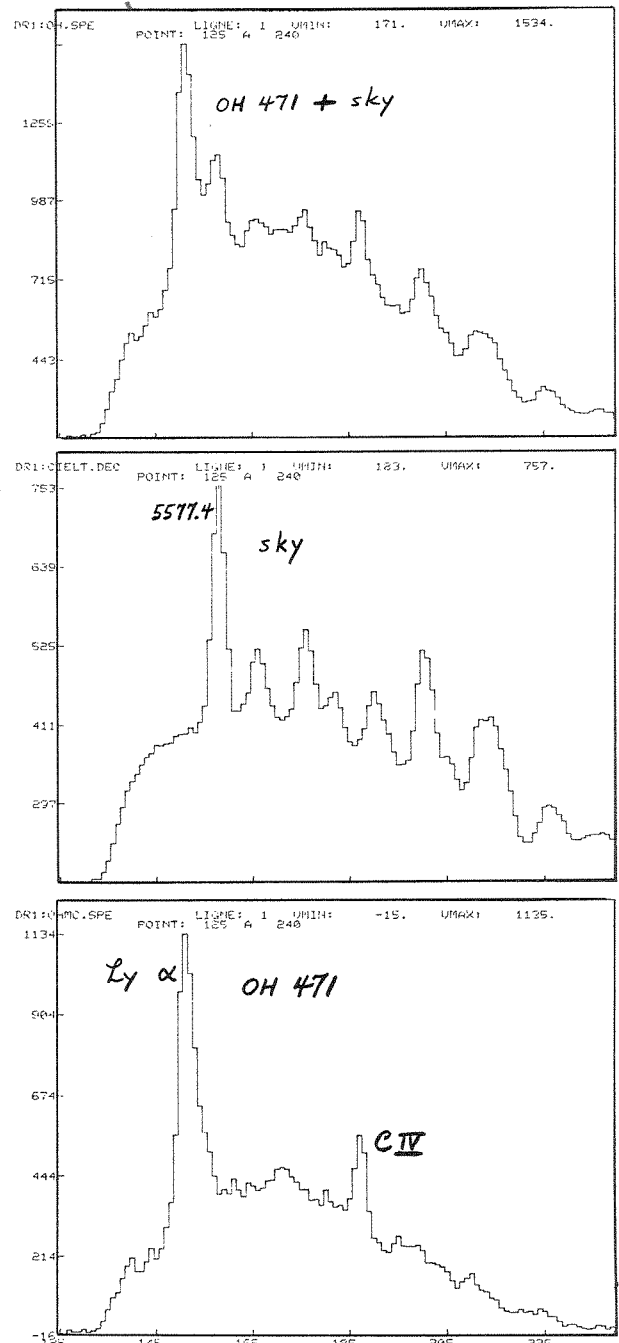


Figure 3