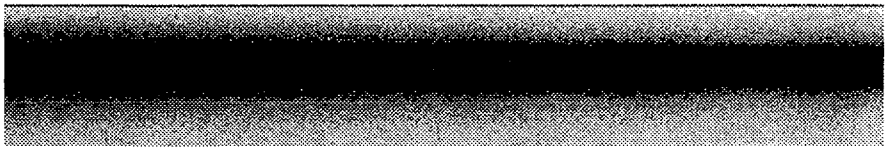

Figure 5: *Two-dimensional FF spectrum centred at 7870 Å.*

main, at virtually all wavelength settings, but their number and intensity increase with the wavelength; none are reported below 5000 Å.

Although Figure 1 could suggest that these ghosts may seriously affect the wavelength calibration, we would like to emphasize that in most cases their presence is negligible. Their intensity is typically much lower than that of true Th-Ar lines. This can be seen directly from Figures 2a and 2b. In Figure 2a the extracted spectrum of Figure 1 is presented (it will be TH6470.1D in the present notation); in Figure 2b the 'ghosts' spectrum for the same region is shown, obtained by extracting the spectrum on the side of the slit and taking away the contribution of the strong, saturated lines.

The presence of these low-intensity ghosts will therefore be most critical in those regions in the RED domain where the paucity of suitable lines makes the wavelength calibration difficult. A careful inspection of the calibration frames is always suggested in the reduction phase.

For several RED settings we have taken multiple exposures slightly shifting the central wavelength (typically by 5 Å). In all the cases the Th-Ar ghosts appear at constant wavelengths.

4.2 Flat Field Ghosts

The presence of ghosts in the Flat Field may be very critical, because their presence may produce uncertain results, changing for instance the shape or the equivalent widths of spectral lines.

FF ghosts were also identified visually using suitable (low) cuts, and it was found that their presence is confined to the spectral range 6170–4560 Å. Most of them fall at the side of the spectrum, thus not influencing the astronomical results for point-like sources.

Unfortunately, some of the FF ghosts do fall over the spectra. In Figure 3 the FF centred around 5865 Å is shown; a ghost is clearly present. In Figures 4a and 4b the extracted FF spectrum and the extracted ghost (the ghost image was extracted on the side of the slit) are shown: the ghost intensity is ~ 0.5 per cent of the FF intensity. Notice that in the extracted FF spectrum no 'bumps' are evident at the pixels corresponding to the ghost.

The presence of FF ghosts is limited to grating angles comprised between 273.5 and 275 degrees, which could suggest that they are due to the grating itself, however, in other grating positions encompassing this range, they were not recorded.

Although their intensity is very low and they are not clearly detectable in the extracted spectra, some care should be taken when the ghost is going to overlap over a spectral line of interest and in very high S/N-ratio observations.

A list of FF ghosts cannot be provided because, unlike Th-Ar ghosts, FF ghosts are *not* at a constant wavelength, but they shift by only a few pixels when changing the λc by several Å. This characteristic is on the other hand quite important, because if the presence of a FF ghost must be avoided at a given wavelength, this can be done by slightly shifting the required λc.

An additional, interesting feature emerges from the comparison of Figures 5 and 6, which show FF exposures taken at 7870 and 4310 Å respectively. The spectra are shown with the same cuts, and they have similar intensity. The level of diffuse light (clearly visible as hazy background out of the slit), is higher in the Blue spectrum. This is a general feature and it is not surprising: in general blue ranges are more sensitive to diffuse light, mostly due to enhanced scattering by dust in the spectrograph optics.

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Figure 6: *Two-dimensional FFspectrum centred at 4310 Å. The cuts are the same as in Figure 5: note the higher level of diffuse light in the 4310 Å frame with respect to the 7870 Å one.*

ERRATUM

Figure 1of the article "New Holographic Grating for the B & C on the ESO 1.52-m Telescope", published in *The Messenger* No. 77 – September 1994, had incorrect labelling of the x-axis. The correct figure is shown here.