

CCD detector of the Main Stellar Spectrograph

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The first results of using a new CCD (1040X 1160 pixels) at the 6 m telescope Main Stellar Spectrograph (MSS) are reported. The standard ISD017A CCD detector, manufactured by the firm "ELECTRON", St.Petersburg, has a 65% quantum efficiency at 6500 Å and a single readout noise of 6 electrons. The CCD electronic system was designed in the Laboratory of Advanced Design of the SAO RAS.

The CCD was tested for being used in spectroscopy and magnetometry with long-focus camera I of MSS which had been used before for obtaining high-dispersion normal photographic and Zeeman spectra, and where the photoelectric Fabry-Perot magnetometer (Chountonov, 1982) had been installed. Under a good seeing of about 1" it was possible to obtain 20 min exposure Zeeman spectra of α^2 CVn with a spectral resolution of 0.1 Å. A series of such spectra were used for investigation of the magnetic field structure of this star (Glagolevskij et al., 1985). We believe that the installation of the CCD on the long-focus camera allowed us to improve the accuracy of spectral and Zeeman measurements and increase the limiting stellar magnitude of the investigated stars.

Before the Conference some spectra of bright stars, in particular of Arcturus, were obtained. Fig. 1 shows part of the spectrum of this star with a high signal-to-noise ratio and a spectral resolution of 0.11 Å. The grating used provided a reciprocal dispersion of 2.6 Å/mm (0.044 Å/pixel). There are some defect columns on one side of the spectrum (in Fig. 1 this part is absent). The vertical axis of the figure shows the number of the registered electrons per column. With camera I a star of 7^m can be recorded with an accuracy of 1% and a spectral resolution of 0.1 Å for 1 hour of exposure time.

Fig. 2 shows a spectrum of the magnetic star γ Equ (4.7 mag) with a spectral resolution of 0.11 Å. Spectra were recorded under bad seeing conditions (3.5-4 arcsec) with an exposure time of 30 min. The left spectral line Fe II 6149 is splitted by a magnetic field of 4 kG.

The first results obtained with the new CCD equipment show that it can be successfully used in spectroscopy, magnetometry and spectropolarimetry of stars.

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References

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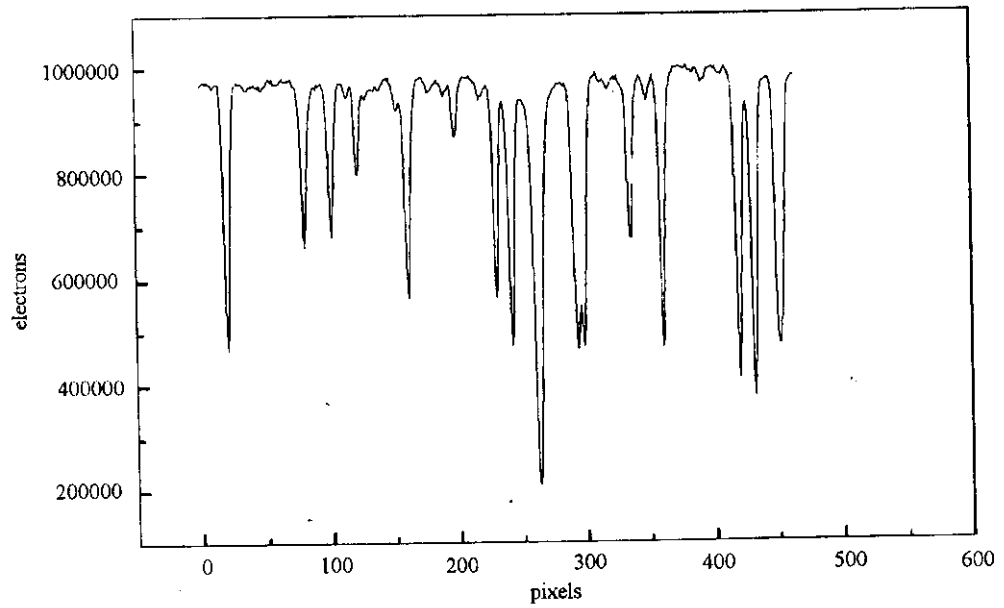


Figure 1: A part of the spectrum of Arcturus. The spectral resolution is 0.11 Å.

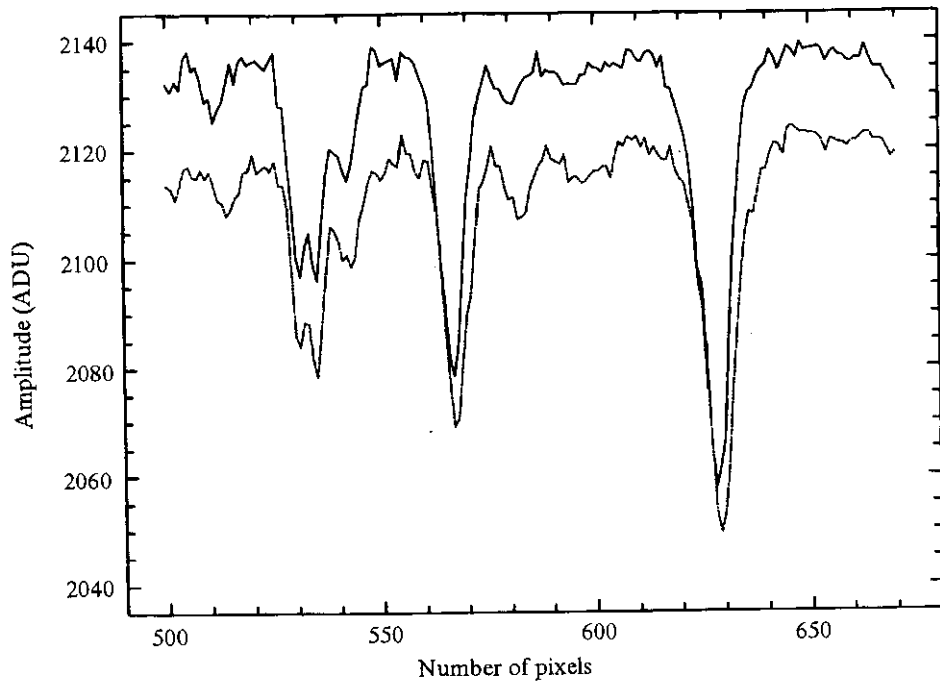


Figure 2: A part of the spectrum of γ Equ (4^m 7) with a spectral resolution of 0.11 Å.