# THE AUTOMATIC DETECTION OF FAINT QUASARS FROM CFHT GRENS PLATES

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ABSTRACT. The automatic quasar detection system (AQD, see Clowes, 1984) has been used to successfully select quasars from prism plates taken by the United Kingdom Schmidt Telescope. Surveys compiled using this technique have a magnitude limit of B-19.5. We present work here which extends the possible survey limit to B-21. This is done by putting plates taken with the Canada-France-Hawaii Telescope's grens (see Richardson, 1984, for a description) through the AQD measuring system. We will follow this work with a comparable photometric survey of the same field.

## 1. THE SELECTION OF CANDIDATES

This survey is of 0.7 square degrees centred on 10 40 0 +5 00 0 (1950). The plate material used for the grens part of the survey was a direct J plate from the UKST, paired with a CFHT grens plate. The multicolour survey uses direct UKST plates taken in the U,B,V,R and I bands. Thus the survey limit will be about B = 21, the plate limit of UKST direct plates. This limit is about a magnitude and a half fainter than that attainable from UKST objective prism plates.

It has been shown before (by Vaucher et al., 1982 and others) that it is possible to pick good quasar candidates from CFHT grens plates. However, such surveys suffer because of the eye's subjectivity in identifying features and inability to integrate across the spectrum to pick up real features on fainter objects.

An obvious route to take in the compilation of large, well defined, candidate lists is the use of a very fast microdensitometer. In this case, the COSMOS measuring machine at the Royal Observatory, Edinburgh (MacGillivray and Stobie, 1984, give an up to date description) was used to scan all plates used. Following our procedure developed for the analysis of UKST prism plates (see Clowes, Cooke and Beard, 1983 and Clowes, 1984) all spectra were then analysed to detect the presence of emission lines of equivalent width greater than a specified value.



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The reason that grens plates have not been processed automatically before is that a grens, being a grating based instrument, produces plates on which brighter objects have multiple images. The corrector system is a part of the instrument, and so no direct plates can be taken with the same field effects. As a result, we used direct plates from the UKST to locate the emulsion cutoff position. A polynomial fitting process was developed to account for field effects between the 2 plates.

## 2. RESULTS

The survey has yielded about 100 objects down to a limit of B = 21, in an area of 0.7 square degrees. For the survey to be used to extend the quasar luminosity function, for example, slit spectra of candidates are required. Very few candidates so far have slit spectra, but Fig. 1 shows the slit spectrum of a faint quasar, independently rediscovered by the survey. There are 4 previously known brighter (B < 19) quasars in the field; 1 was missed by the survey, being overlapped by the image of a bright star.

## 3. REFERENCES

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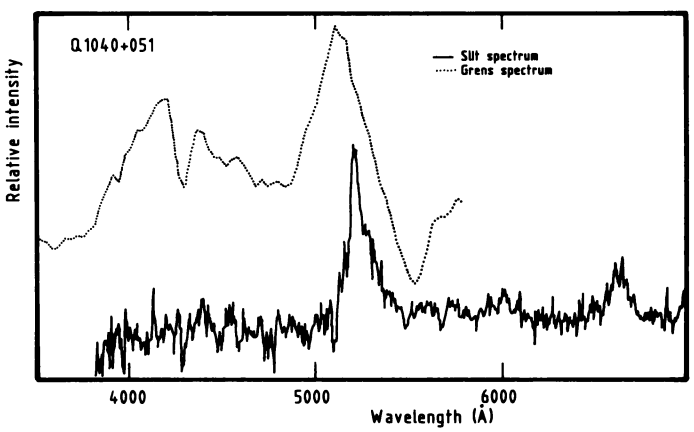


Fig. 1: Spectra of a quasar discovered by S. D'Odorico (private communication), of B ≅ 20.8, z ≅ 3.27. This object was independently selected by this survey because of the Ly α emission line.

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