AUTOMATED QUASAR DETECTION

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The existing spectral searches for quasars have increased the number of quasars known very substantially but have not contributed proportionately to an understanding of the collective properties because of the selection effects. To fully exploit the spectral searches we have developed the technique of automated quasar detection (AQD) using objective-prism plates from the UK Schmidt Telescope, the COSMOS measuring machine at the Royal Observatory Edinburgh, and the STARLINK nodes at Durham and Edinburgh.

AQD has the following advantages: (i) the selection criteria and consequently the selection effects are known, pre-defined and rigidly maintained, (ii) large and complete samples may be obtained from several plates, (iii) emulsion responses are taken into account, (iv) selected objects emerge with low-resolution spectrophotometry and values for equivalent widths and line widths, (v) repeat searches using new plates need not be avoided, (vi) non-spectral searches (eg selection by ultraviolet excess) can be run simultaneously, (vii) measuring machines and computers do all the repetitive work.

Preliminary results for a field that has already been searched by eye indicate that AQD is very successful: essentially all of the eyeball quasars that satisfied the selection criteria were re-discovered (a few were mistakenly rejected during quality testing) and new quasar candidates were discovered in significant numbers.