COMPOSITE OPTICAL SPECTRA OF RADIO QUASARS

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1. Introduction

Primarily to illustrate the effects of orientation on the optical properties of radio-loud quasars, we have created a set of composite optical spectra (see also Baker & Hunstead 1995). Optical spectra drawn from the 408-MHz Molonglo Quasar Sample (MQS) have been coadded in four sets according to R, the ratio of radio core-to-lobe flux, which is used as an orientation indicator (eg. Orr & Browne 1982). Compact steep-spectrum (CSS) quasars (see review by Fanti, this volume) have been combined separately, revealing for the first time many distinguishing features in their average spectra.

2. The Composite Spectra

Figure 1 reveals clear differences between quasars of different R and the CSS quasars. A detailed comparison is made in Baker & Hunstead (1995). In summary, we find that with decreasing R (i) the optical continuum steepens, (ii) the 3000Å broad emission feature decreases in relative strength, and (iii) the narrow-line equivalent widths, broad line widths and Balmer decrements increase (Baker et al. in prep.). The above trends suggest that the nuclei of many lobe-dominated quasars are viewed through layers of dust, perhaps associated with the hazy outer regions of a torus.

The composite for the CSS quasars in the MQS is especially revealing. The average continuum slope is a very steep power law, with broad features, such as around 3000Å, missing. Enhanced narrow-line emission,

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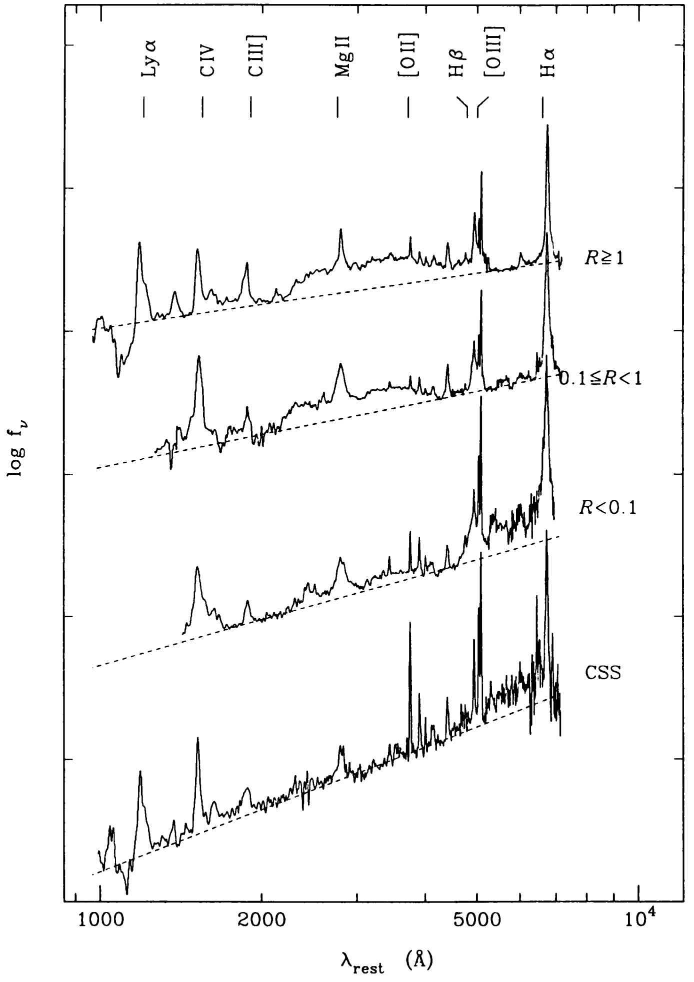

Figure 1. Composite spectra for the MQS, separated according to R (see text). Best-fit power-law spectral slopes are shown as dashed lines (Baker & Hunstead 1995).

particularly low-ionisation species, may indicate strong jet–ISM interactions. Self-absorption of Mg IIλ2798 and the low Ly α/C IV ratio point to heavy absorption in these sources.

References

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[3] Orr, M. and Browne, I.W.A. (1982), *MNRAS*, **200**, 1067