

KINEMATICS OF THE BLR CLOUDS IN AGNS AND QUASARS

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Abstract. The Ly α and the C IV line profiles in the spectra of quasars and Seyfert 1 galaxies can be described by a combination of a narrow and a broad component. Over four orders of magnitude in luminosity the profiles of Ly α and C IV lines in the quasar spectra are very similar but a change is observed in the C IV profile in the spectra of Seyfert 1 galaxies which cover a smaller luminosity range. The correlation of the FWHM of Ly α , C IV and H β lines suggests that the Ly α and C IV lines are emitted from clouds in a similar kinematic environment but part of C IV line may also be emitted from clouds which emit the H β line.

Key words: Quasars, Seyfert 1 galaxies, Line profiles

1. Introduction

The profiles of Ly α and C IV lines in a sample of radio loud (RLQ) and radio quiet (RQQ) quasars and Seyfert 1 galaxies have been analysed. The sample is derived from the archive of *IUE* spectra, and only spectra with a continuum signal-to-noise ratio of ten or higher have been selected.

2. Discussion and Conclusions

The profiles of Ly α and C IV lines in the spectra of both the quasars and the Seyfert 1 galaxies are composed of a narrow (core) and a broad component and these lines are very symmetric in the quasar spectra. Over four orders of magnitude in continuum luminosity the object-to-object variation in the profiles of these lines, in the quasar spectra, is very small, but this is not true of the C IV profile in the spectra of Seyfert 1 galaxies. The FWHM of the Ly α and C IV lines and that of C IV and H β lines are correlated. For the Ly α /C IV correlation the Spearman rank correlation coefficient $r = 0.85$ and the slope of the straight line fitted to these data is $s = 0.77 \pm 0.22$. For the C IV/H β correlation $r = 0.68$ and $s = 0.68 \pm 0.07$, however, there is *no* correlation between the FWHM of Ly α and H β lines.

The high degree of symmetry of both Ly α and C IV lines, and both these lines are optically thick, seems to rule-out unidirectional flow of the BLR clouds. The correlation of the FWHM of Ly α and C IV lines suggests that these lines are emitted from clouds in a similar kinematic environment, but the correlation between the FWHM of C IV and H β lines seems to indicate that a part of the C IV line may also be emitted from clouds whose kinematic environment is similar those which emit the H β line and these clouds are not significant Ly α emitters.

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