Asymmetry of the C IV λ 1549 Å line in a sample of RQ and RL AGN

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Introduction

- We investigate the asymmetry of the C IV λ 1549 Å line and [O III] λ λ 4959, 5007 Å lines in a sample of Radio Quiet (RQ) and Radio Loud (RL) Active Galactic Nucleis (AGN).

- We compared those asymmetries, trying to see if there is any kinematical correlation between the Broad Line Region (BLR) where C IV λ 1549 Å lines arise and Narrow Line Region (NLR) where [O III] λ λ 4959, 5007 Å lines are formed.

- Correlation could imply a possible influence of jet outflow on kinematical properties of NLR and BLR.

Introduction

- **C IV λ 1549 Å -line is one of the strongest high-ionization UV lines and it arise in the Broad Line Region (BLR) of Active Galactic Nuclei. It is a doublet with components C IV λ λ 1548, 1551 Å . Often, C IV λ 1549 Å is showing a blueshifted profile, possibly indicating an outflow from an accretion disk.**

- **[O III] λ λ 4959, 5007 Å forbbiden lines originate from the ionized Narrow Line Region (NLR). They usually show a complex structure. The shape of the emission lines are affected by the NLR kinematics. The blue asymmetry in line shapes could be explained by an outflow in the NLR caused by the interaction with radio jet. The line intensity ratio of 5007 and 4959 is 2.98.**

The sample and analysis

- Based on the S/N quality, we selected 28 AGN spectra from the atlas of Marziani et al (2003) .
- To analyze the UV C IV λ 1549 Å lines, we substracted continuum and contaminating N IV λ 1486 Å, He II λ 1640 Å and O III λ 1663 Å lines.
- Than we applied χ^2 minimalization routine and fitted the C IV lines with two Gaussian functions (narrow Gaussian fit the core of the line and broader Gaussian fit the wings of the C IV line).
- The shift difference between the two Gaussians correlate with the C IV asymmetry.

- We apply the same method for analyzing the [O III] λ λ 4959, 5007 Å lines. We substracted the continuum and contaminating Fe II and Hβ lines, we fit the peak of [O III] λ λ 4959, 5007 Å lines with narrow and the wings with broad Gaussian.

- The asymmetry is considered separately for RQ and RL objects

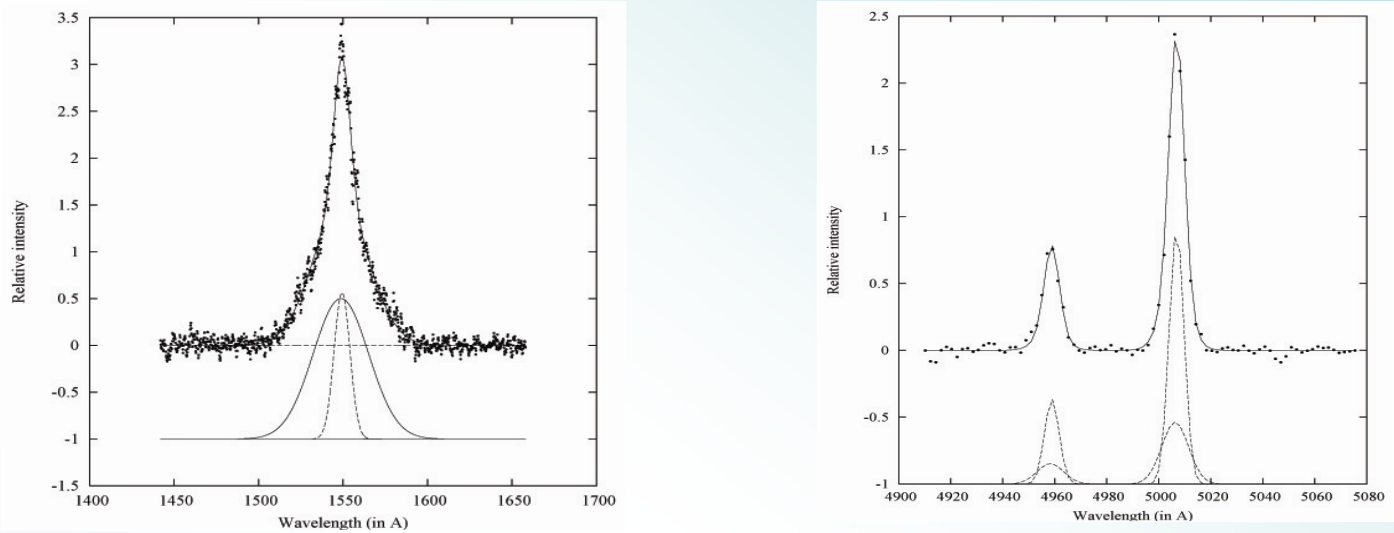


Figure 1: Example of fits of **4C 73.18** object: CIV λ 1549 Ǻ (left) and [O III] λλ 4959, 5007 Ǻ (right). The asymmetry of lines is weak.

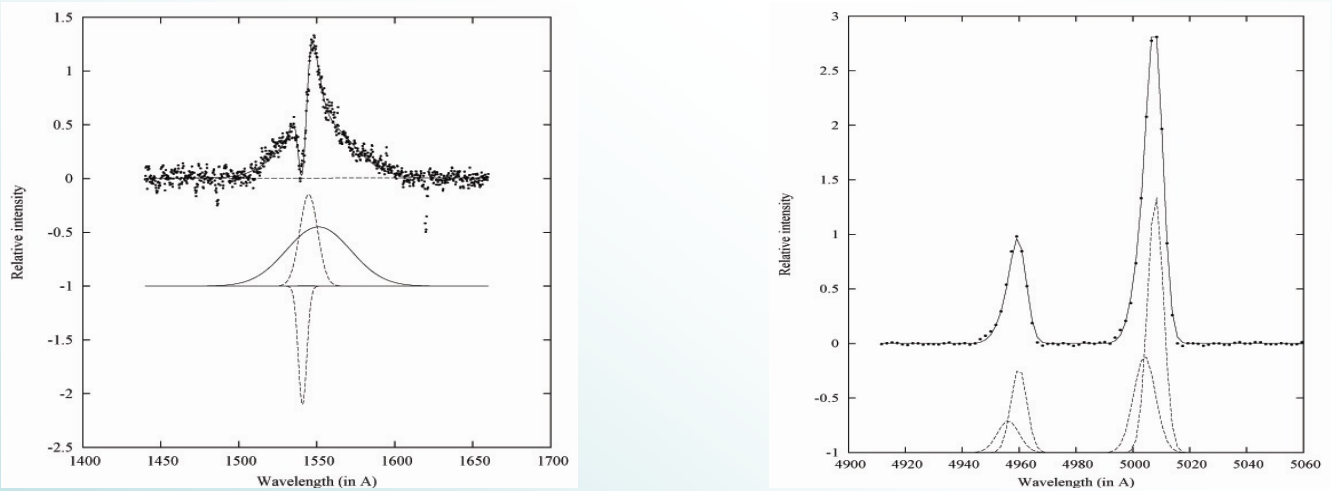
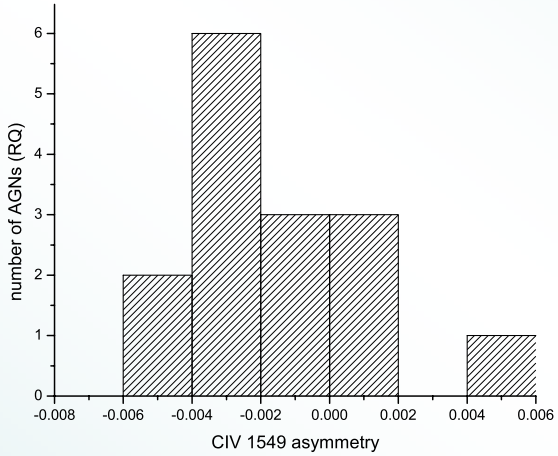


Figure 2: Example of fits of **PG 1704+608** object: C IV λ 1549 Ǻ (left) and [O III] λ 4959, 5007 Ǻ (right). The lines show a strong asymmetry.

Results:



RQ

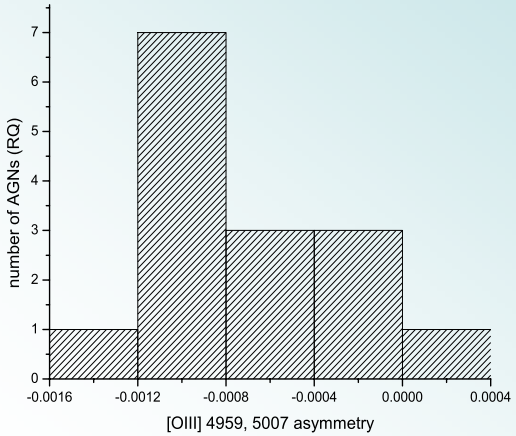
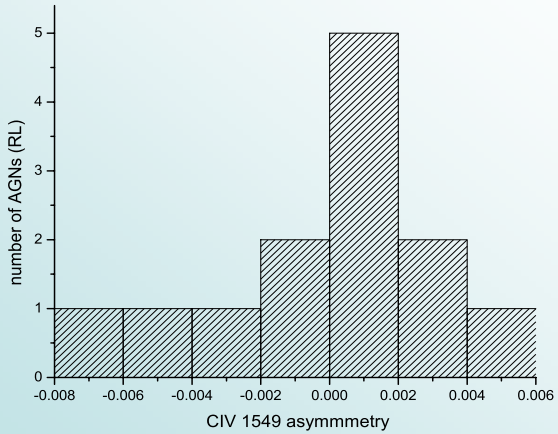


Figure 3: Distribution of asymmetry of C IV λ 1549 Å (left) and [O III] λ λ 4959, 5007 Å (right) for RQ sample.



RL

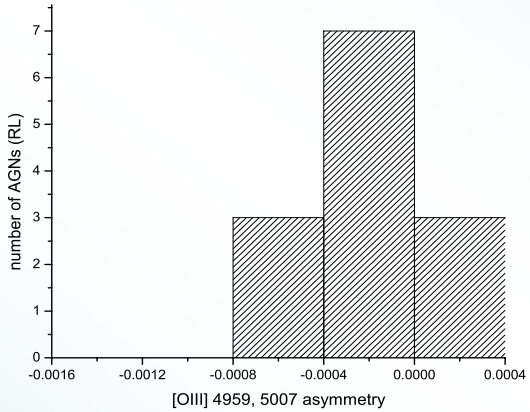
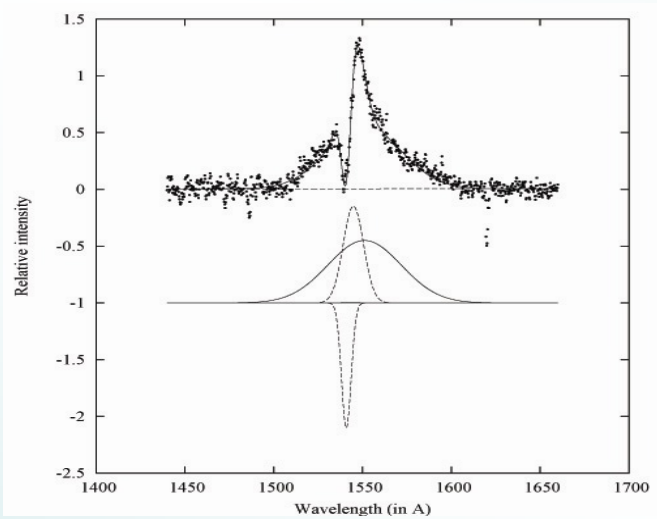
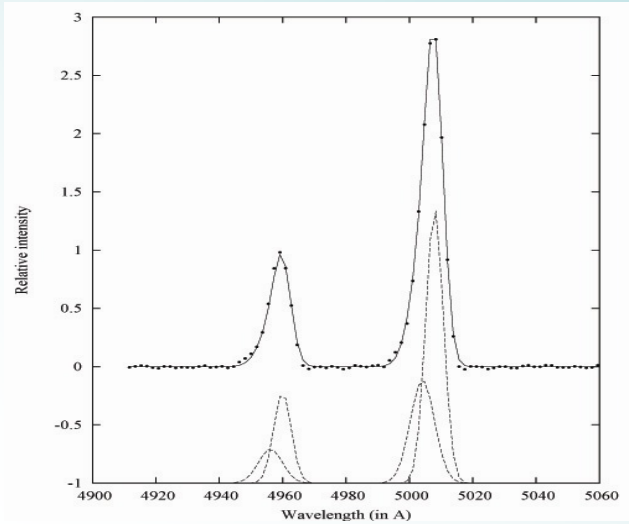
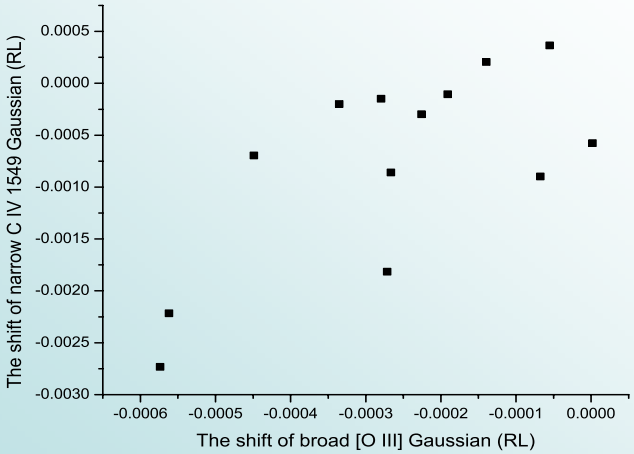


Figure 4: Distribution of asymmetry of C IV λ 1549 Å (left) and [O III] λ λ 4959, 5007 Å (right) for RL sample.

Results:







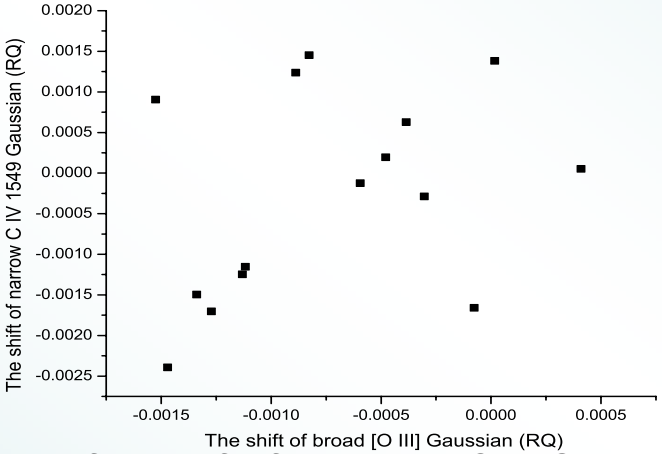


Figure 5: The shift of narrow CIV 1549 Gaussians as function of the shift of the broad [OIII] Gaussians for RL (left) and for RQ (right) sample.

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Thank you for your attention