The Radio Dichotomy in Extreme Objects: Studying Quasars with FWHM greater than 15000 km/s

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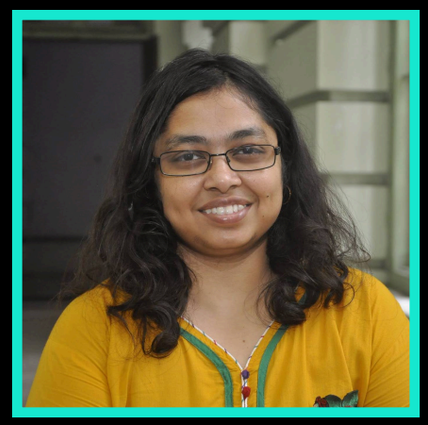

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Abstract

This study shows that radio-loud fraction (RLF) increases for increasing full width half maximum (FWHM) velocity of the Hβ broad emission line ($z<0.75$). Our data has been obtained from Shen et al. (2011) catalogue. We are getting RLF is increasing with FWHM of Hβ broad emission line. To investigate the reason, in this preliminary study we analyse various properties like bolometric luminosity, optical continuum luminosity, black hole (BH) mass, Eddington ratio and covering fraction of RL quasars (RLQs) and RQ quasars (RQQs) sample which have FWHM greater than 15000km/s (High Broad Line or HBL) and we have found the difference of RLQs and RQQs only in luminosities. From our results we also have predicted accretion disk-jet connection. We also compare our HBL sample with the rest of the sample to check for possible differences in properties. We find our HBL objects to have the lowest Eddington ratios and that hints toward a geometrically thick disc for these extreme sources.

Main Question And Our Approach

- Surveys have shown RLQs constitute 10% of the total quasar population and rest are RQQs. But we don't know if they are consistent in different parameter spaces.
- To check that we plotted RLF with FWHM of broad Hβ emission line and we have seen that RLF is increasing with FWHM.
- To look more into it, we have compared the fundamental properties like bolometric luminosity, BH mass, optical continuum luminosity and Eddington ratio of RLQs and RQQs in our HBL sample (FWHM > 15000km/s).
- Also, we have compared our HBL sample with the rest Hβ sample.

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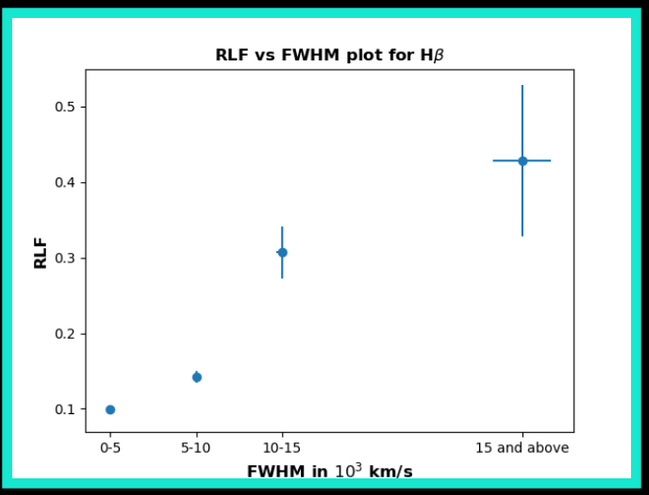
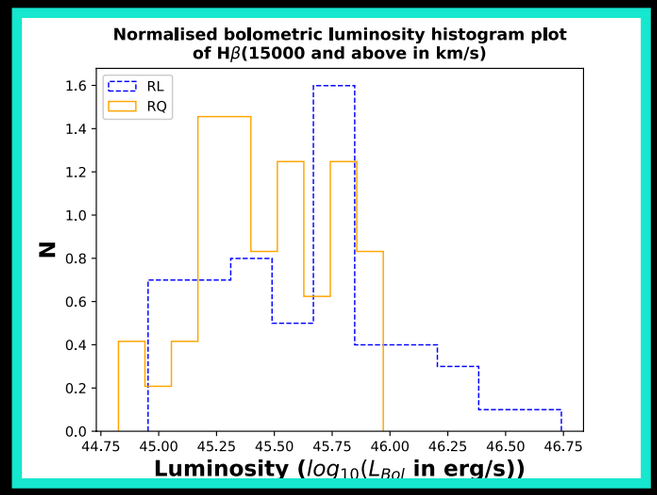
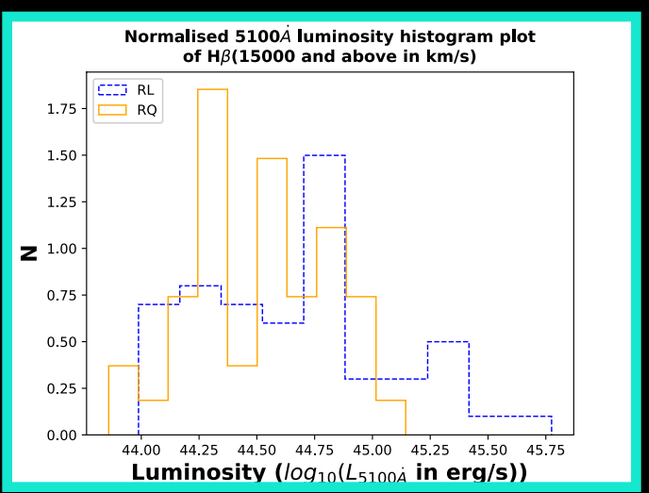
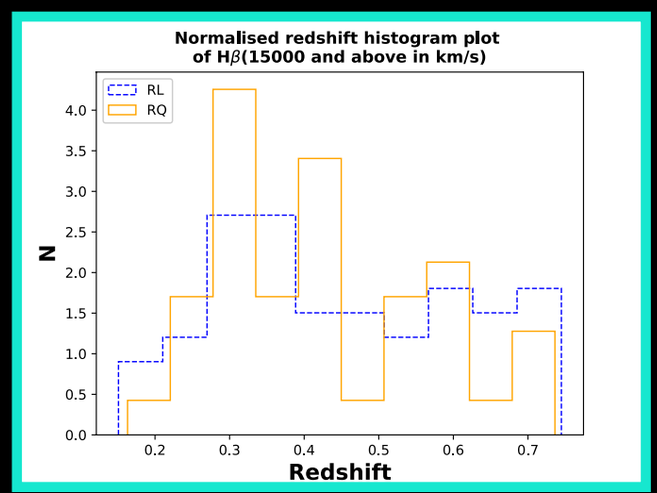
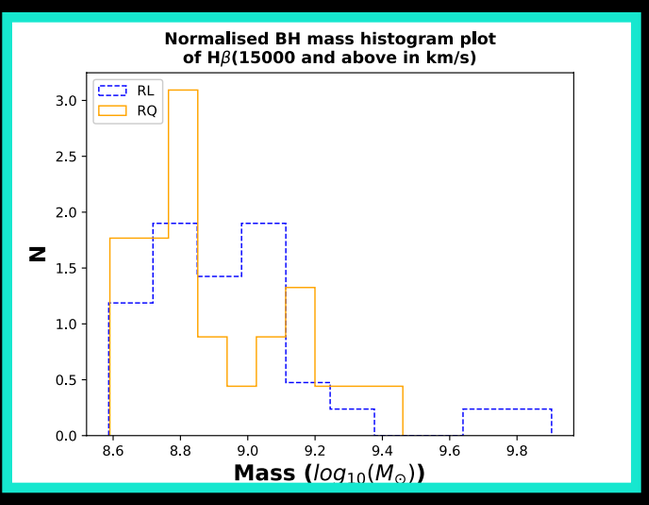
Results

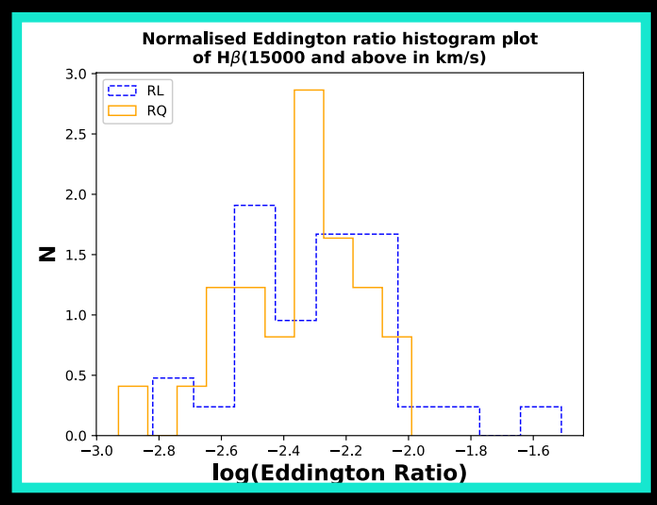








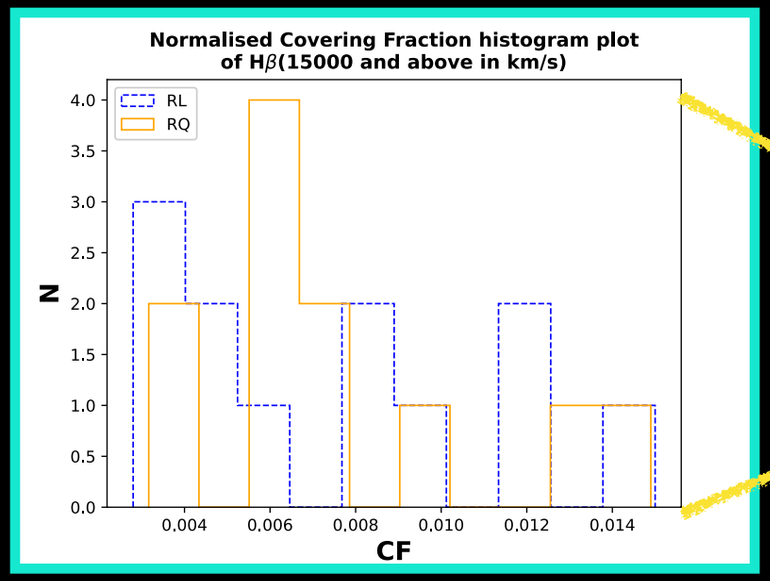


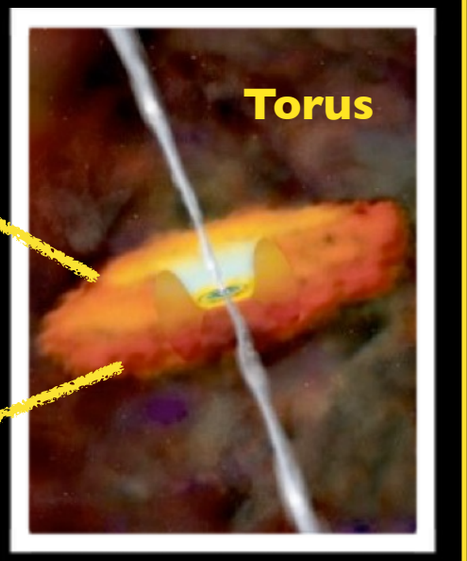


Conclusions

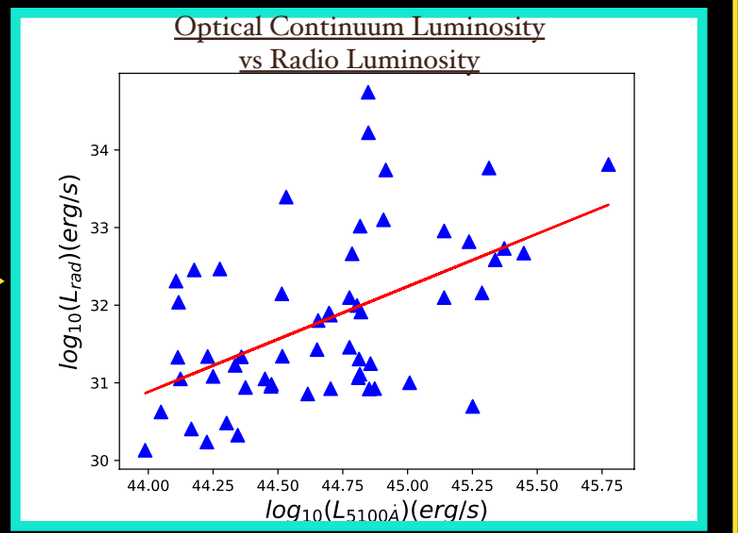
- We have seen Radio Loud Fraction is increasing with FWHM.
- For HBL, RL are having higher Bolometric luminosity and Continuum luminosity: RL are intrinsically brighter than RQ.
- Redshift distributions are similar.
- For HBL, no difference have been found in BH mass and Eddington ratio between RL and RQ.

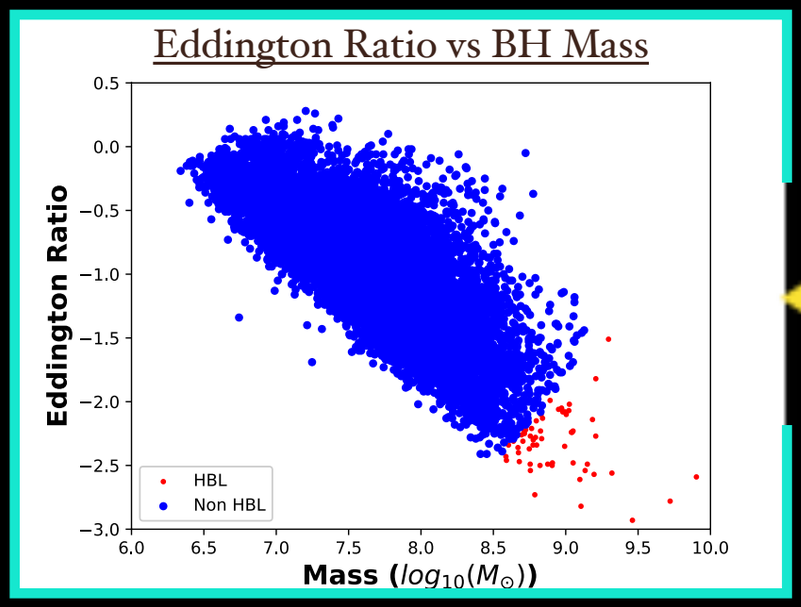
Results





Disk-Jet connection





Thick-Disk Suggested

Conclusions

- For HBL, dust distribution is similar for both RL and RQ.
- Thick disk accretion model has been suggested for HBL.
- Connection between accretion disk and jet can be inferred for HBL. It has been seen for non-HBL as well but for HBL it is stronger.

References

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