

OPTICAL DIFFERENCES BETWEEN RADIO-LOUD AND RADIO-QUIET QSOs

PAUL J. FRANCIS

*Steward Observatory, University of Arizona
Tucson AZ 85721, U.S.A. **

Abstract. We analyse the rest-frame UV spectra of a complete sample of optically selected radio-loud and radio-quiet QSOs. Our results are:

1: Broad absorption-line QSOs (BALQSOs) are all radio quiet, *but* they are strongly clustered toward the top end of the radio-quiet population in radio power.

2: Radio-loud QSOs have higher equivalent-width, narrower high ionisation emission-lines than radio-quiet QSOs.

1. Observations

We observed 250 of the brightest QSOs in the optically selected Large Bright QSO Survey with the MMT and VLA. A clearly bimodal distribution of radio-to-optical flux ratios was found.

2. Results

2.1. ABSORPTION LINES

None of the radio-loud QSOs showed broad absorption lines (BALs). However, the BAL QSOs were not uniformly distributed through the radio-quiet population; they were strongly clustered towards the highest radio-to-optical flux ratios of the radio-quiet population (99.99% confidence). This result can be explained if, for radio-quiet QSOs, the BAL covering factor is proportional to the radio flux.

2.2. EMISSION-LINES

We studied the Lyman- α (1216), C IV (1549) and C III] (1909) emission-lines. In radio-loud QSOs they had $\sim 30\%$ higher mean equivalent-widths (97 % confidence) and were 30% narrower (96 % confidence) than in radio-quiet QSOs. This is evidence for more extended emission-line regions in radio-loud QSOs.

3. Further Reading

See Francis, Hooper & Impey, 1993, *Astronomical Journal* 106, 417 and references therein for more details and discussion.

* Current Address: School of Physics, University of Melbourne, Parkville, Victoria, Australia 3052