The Environments of Optically–Selected QSOs.

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In recent years much attention has been focussed on the environments of low redshift QSOs. In particular, Yee and Green (1987) have found that the average environment of radio–loud QSOs at $z \simeq 0.6$, as measured by the QSO–galaxy spatial covarience function, is over three times richer than that of radio–loud QSOs at $z \simeq 0.4$. This strongly indicates that there has been a steep evolution in the numbers of QSOs in rich clusters over a period of 10^9 years. This observation is therefore inconsistent with pure luminosity evolution models, which preserves QSO number with epoch, currently employed by a number of authors (see e.g. Boyle *et al*. 1987) to explain the observed redshift dependence of the QSO luminosity function. However, since over 90% of QSOs are *radio–quiet*, the main test concerning the validity of pure luminosity evolution is to look for similar evolutionary effects in the preferred environments of optically–selected QSOs.

We have therefore obtained deep CCD frames using the 2.5m Isaac Newton Telescope for 8 radio–quiet QSOs with $0.55 < z < 0.7$ in the UVX spectroscopic survey of Boyle *et al*. (1987). A preliminary analysis of the data has been carried out and we find, on average, a 15% excess of faint ($r < 23.5$ mag) galaxies within a projected distance of $750h^{-1}$kpc from each QSO. To make a direct comparison with the results of Yee and Green (1987), we followed their method for obtaining B_{gq}, the amplitude of the QSO–galaxy correlation function, using their adopted galaxy luminosity function including a 0.8 mag evolution in r. We find that the strong evolution in the environments of *radio–loud* QSOs found by Yee and Green (1987) is not witnessed in the environments of the *radio–quiet* QSOs. The ratio of the QSO–galaxy to galaxy–galaxy correlation function amplitude, $\langle B_{gq}/B_{gg} \rangle$, is only equal to 2.3 ± 1.3 for our radio–quiet sample compared to $\langle B_{gq}/B_{gg} \rangle = 8.0 \pm 2.1$ obtained by Yee and Green (1987) for radio–loud QSOs over a similar range in redshift. However, we still cannot rule out any optical luminosity dependence in the above result as the absolute magnitudes of the QSOs in the Boyle *et al*. (1987) sample are 2 – 3 magnitudes fainter than the QSOs used by Yee and Green (1987). Nevertheless, the above result does indicate that an important correlation may exist between the environments of QSOs and their radio or optical luminosities. Further observations are therefore vital to ascertain the true correlation, thereby providing a valuable insight into the triggering and fuelling mechanisms of QSOs.

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