

Cosmic Evolution of Quasar Host Galaxies

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Abstract. Using *HST* WFPC2 and NICMOS observations, and our 2D image weighting and modelling technique (Floyd *et al.* 2004), we have reliably disentangled host from nucleus for nine optically matched radio-loud quasars (RLQ) and nine radio-quiet quasars (RQQ) at $z = 1$ & 2, in two bands spanning the 4000Å break. The resulting galaxy colours provide the first unbiased estimates of galaxy mass for a statistical sample of quasars at high redshift, and indicates a difference in the evolution of radio-loud and radio-quiet objects.

Keywords. galaxies: active, galaxies: fundamental parameters, (galaxies:) quasars: general.

We revisit the sample of Kukula *et al.* (2001), consisting of 18 QSOs at $z \sim 1$ & 2. Each epoch has equal numbers of RLQs and RQQs that are optically matched to ensure no a priori selection bias. We used NICMOS *J* and *H* band imaging in Kukula *et al.* (2001) to explore the rest-frame *V* hosts. Here we add WFPC2 *R* and *I*-band imaging (Floyd *et al. in preparation*) to explore the rest-frame *U*. We follow the observing and modelling strategy of Floyd *et al.* (2004) with deeper integrations of 3600–7800 s. Both the RL and RQ hosts follow roughly passive evolution of 1–4 L^* populations (Fig. 1). However, within our sample, the RQQ hosts in general have bluer colour than their RL counterparts, indicating somewhat higher star-formation rates. This implies that the RLQ hosts have already formed the majority of their stars at an earlier epoch, while the RQQ hosts are still star-forming. RLQs are present in more massive, older systems and/or they can actively truncate star-formation in their hosts.

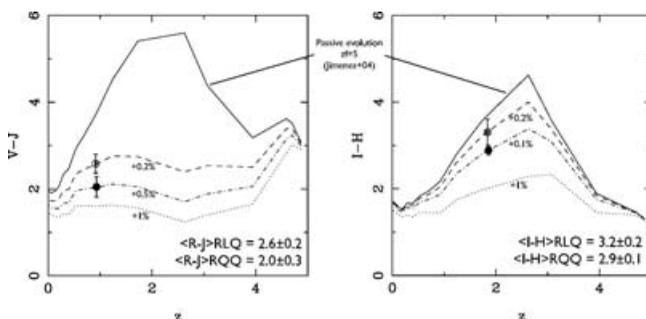


Figure 1. Mean R-J and I-H against z for RLQ (open) and RQQ hosts (filled). A difference in host colour is observed at each redshift. Passive evolution (solid line), plus Jimenez *et al.* (2004) SSP “frosting” models (% mass in ongoing star-formation indicated) shown for comparison.

References

- Dunlop, J. S., *et al.* 2003, *MNRAS* 340, 1095 Jimenez, R., *et al.* 2004, *MNRAS* 349, 240
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