

BURIED QUASARS IN RADIOGALAXIES?

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Abstract. We report on the results of a near-infrared imaging survey of low-redshift radiogalaxies. We find that one of our 13 objects harbours an unresolved source at K , which we interpret as a quasar-like central engine seen through ~ 40 magnitudes of visual extinction.

We have undertaken J and K -band imaging of a sample of 13 low-redshift ($z < 0.11$) narrow- and absorption-line radiogalaxies. Radial surface brightness profile fitting was then performed with a two-component model of unresolved central source and de Vaucouleurs $r^{1/4}$ law to determine whether we see a heavily-reddened quasar continuum, as predicted by current 'unified schemes' (see e.g. Antonucci 1993 for a review). We have also performed an identical analysis on two low-redshift broad-line radiogalaxies, and find that our estimates of the reddening agree well with those obtained from the Balmer decrements of the broad lines.

We detect such a source in one of our objects, the giant radiogalaxy PKS 0634-205 and we determine the magnitude of this source to be $m_K = 15.67 \pm 0.20$. We can estimate the unobscured nuclear continuum at $2.2 \mu\text{m}$ as the [O III] $\lambda 5007$ line is a good indicator of quasar power (its equivalent width is nearly constant in quasars; Miller *et al.* 1992), and we thus derive an obscuration of $A_V = 39 \pm 12$ mag. We estimate an upper limit for the remainder of our sample to be $m_K \approx 17.5$, which typically implies $A_V > 25$ mag. Although our sample is relatively small, we suggest that the reason why we do not see any sources with inferred extinctions in or below this range is because the dusty torus favoured in the present paradigm is 'hard-edged', i.e. its optical depth varies very rapidly with viewing angle at some critical value.

Having estimated the reddening, we can correct the K -band and soft X-ray points and determine the number of ionizing photons, assuming a typical quasar SED. This figure (\sim a few $\times 10^{55}$ photons s^{-1}) agrees well with the value determined from longslit spectroscopy of extended emission-line gas (see Hansen *et al.* 1987 for narrow-band images) and this agreement adds extra credence to our conclusion that PKS 0634-205 is a quasar firing into the plane of the sky.

References

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