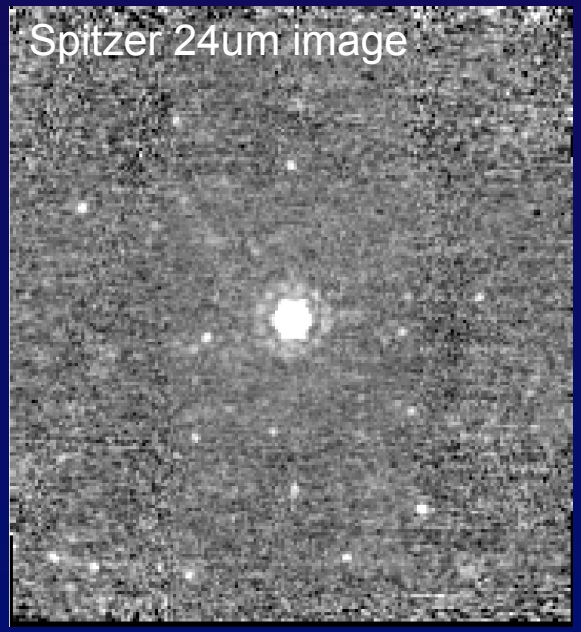
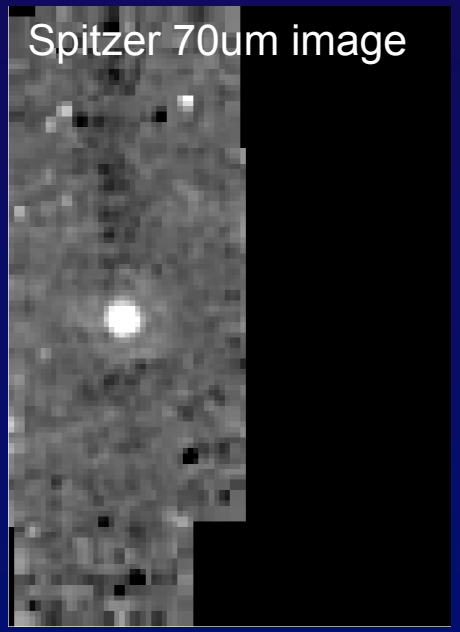
The University Of Sheffield.

Mid to Far-infrared Colours of a Sample of Radio Loud AGN



PKS1949+02
(3C403)



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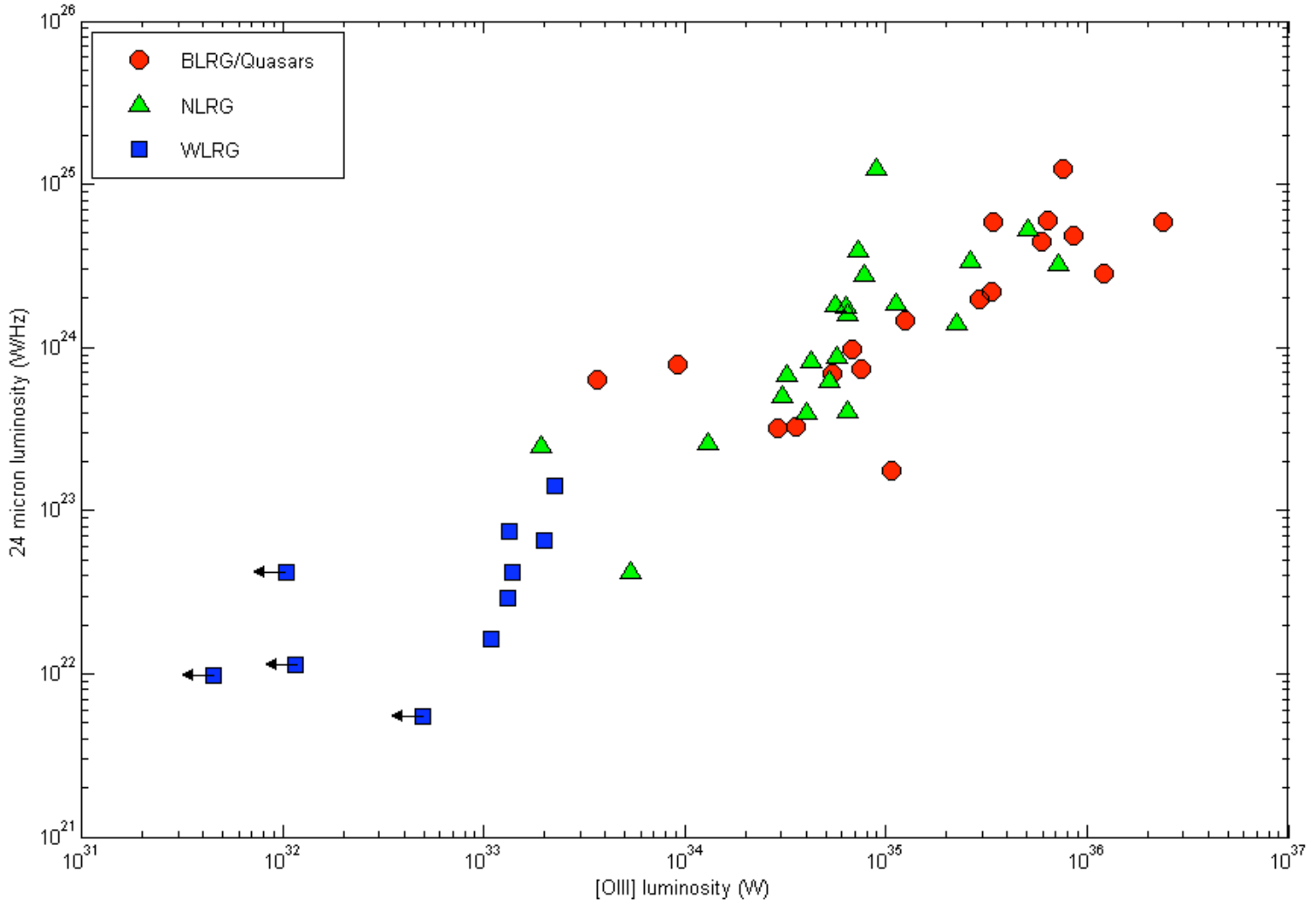
Infrared wavelengths and AGN

- Orientation based Unification of AGN (*Barthel 1989)*
- Infrared observations of AGN are particularly useful:
  - Emission is less obscured at these wavelengths
  - The dust torus, heated by the active core re-radiates at infrared wavelengths
- Comparing mid and far-infrared emission may reveal an effect of orientation due to higher extinction at shorter wavelengths from the dust torus
- Studies have indicated that quasars are more luminous and have warmer colours than narrow line radio galaxies at mid-infrared wavelengths:
  - IRAS, *Heckman et al. (1994),* detect 30% at 60μm
    Hes et al.(1995), detect 6% at 60μm
  - ISO, *Hass et al. (2004) ,* detect 46% at 60μm
  - Spitzer, *Shi et al. (2005),* heterogeneous sample
    Cleary et al. (2006), detect 62% at 70μm

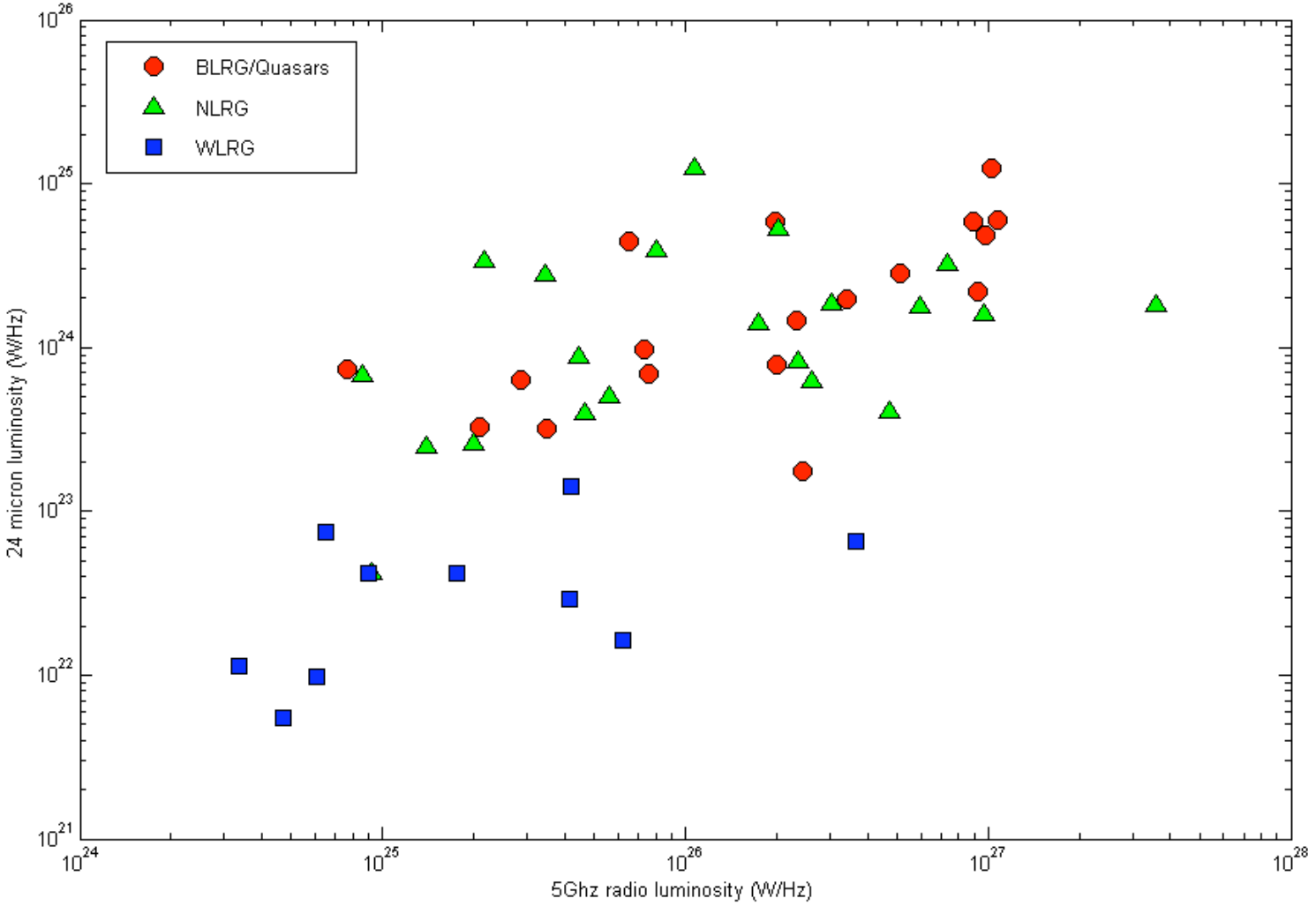
Our Sample

- 2Jy sample *(Tadhunter et al. 1993).* Flux limit $S_{2.7Ghz}$>2Jy
- Complete sample of 49 powerful radio galaxies and steep spectrum selected quasars
- Intermediate redshifts: 0.05<z<0.7
- Contains broad, narrow and weak line emitting objects
  - 18 BLRG/Quasar
  - 21 NLRG
  - 10 WLRG
- Unique as deep optical spectra exist for the whole sample
- Deep Spitzer infrared observations detect 100% of objects at 24μm and 89% at 70μm

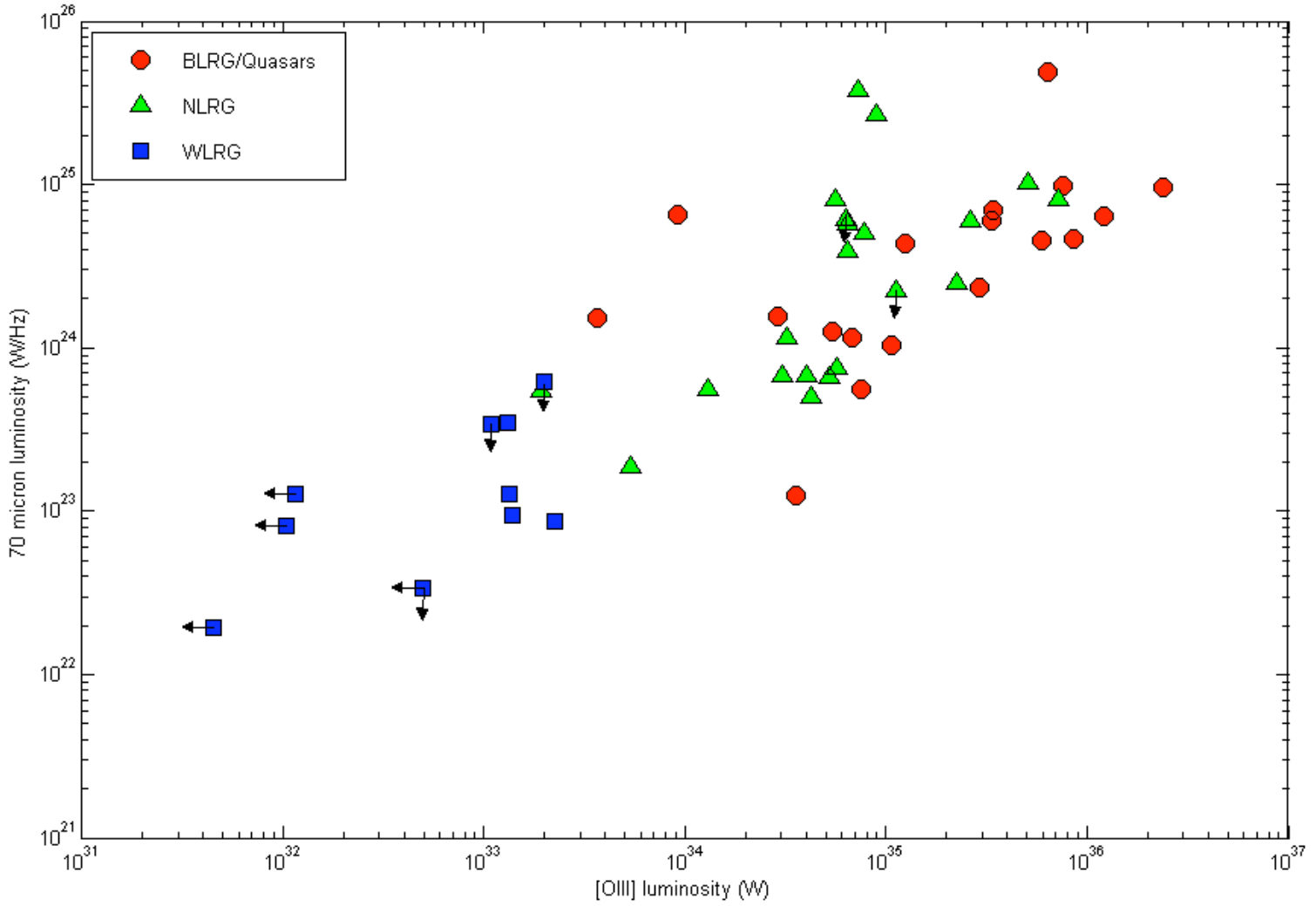
24 microns vs. [OIII]



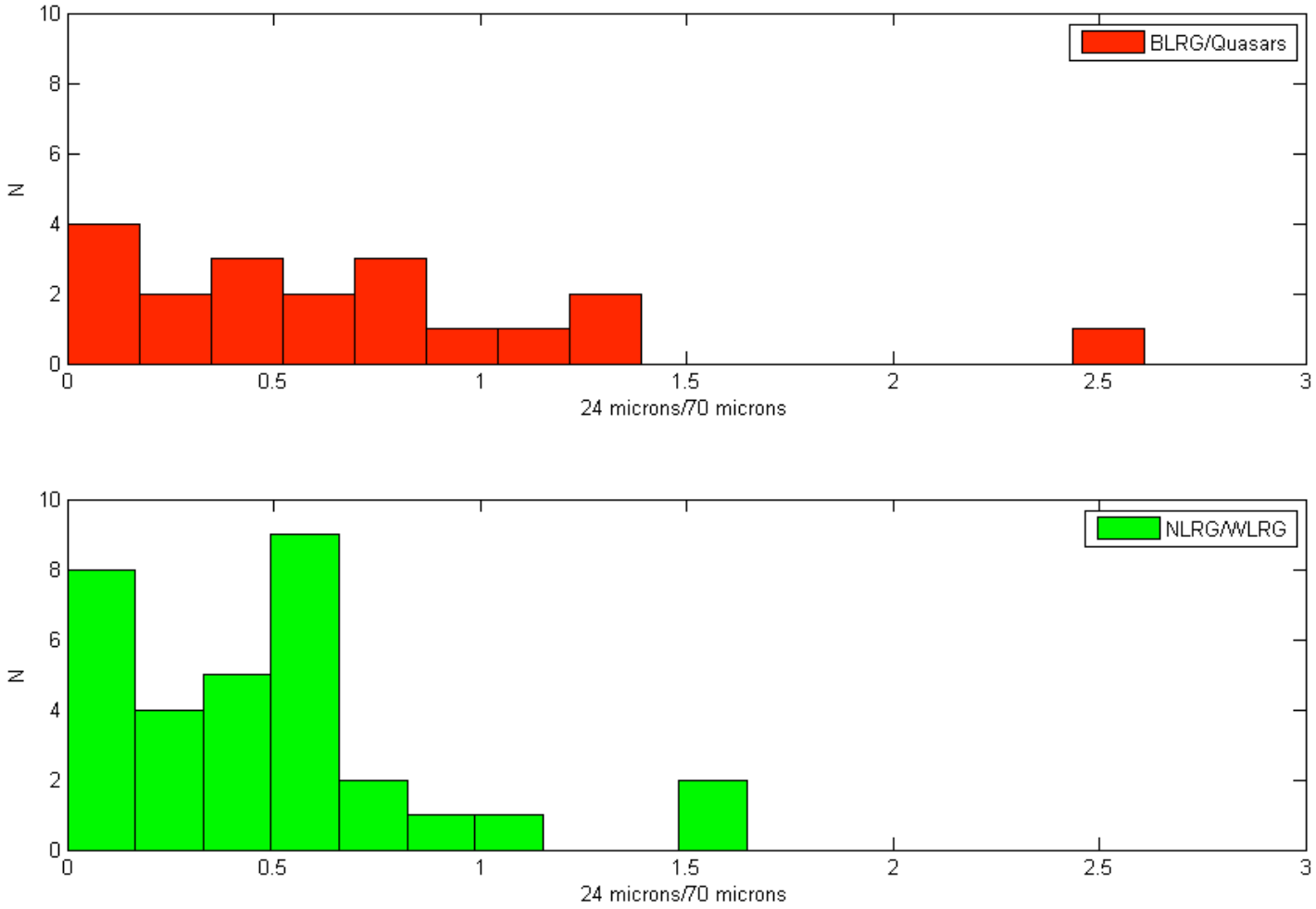
24 microns vs. Radio



70 microns vs. [OIII]



24/70 micron Colour



The Result

•No evidence for higher mid-infrared extinction for quasars/BLRG in relation to NLRG

Explanations?

- Other contributions to infrared emission; non-thermal, starburst
- The dust torus is optically thin to mid and far-infrared emission

- Shorter mid-infrared wavelength observations should reveal absorption by dust torus