

INFRARED IMAGES OF DISTANT 3C RADIO GALAXIES

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ABSTRACT We have obtained J and K images of radio galaxies with redshifts of up to 3.4, including 3C 41, 54, 124, 194, 256, 257, 265, 294, 326.1, 356, 437, 441, & 454.1, and B2 0902+34. The observations were made using the Infrared Imager (IRIM) on the KPNO 4m telescope. Stellar image sizes (FWHM) are from 0.85 to 1.2 arcseconds, roughly 10 kpc for $H_0=50$. The limiting sensitivity (3σ in 1 square arcsecond) of the deepest images is approximately K=21 ($2.7\mu\text{Jy}$).

The galaxies were selected from those with the largest known redshift, primarily 3C sources whose R band and redshifted [OII] 3727 Å narrow band images showed extended asymmetric emission with multiple components, frequently aligned with the radio lobe axis (McCarthy *et al.* 1987 Ap.J. Lett. 321, L29). Such an alignment could be explained by star formation induced by the interaction of a radio jet with the ambient medium. The R band measures emission at 0.2 to 0.4 μm in the rest frame for our sample. Infrared imaging allows us to examine emission at longer wavelengths which presumably arises from red giant stars and is more

representative of the bulk of the stellar population.

In general, we find that the infrared morphologies of these galaxies are just as peculiar as their optical morphologies. For most of the galaxies, when asymmetric structure is present in the optical, structure with the same orientation is seen in the infrared, although each object has its own quirks. For example, 3C356 ($z=1.08$) has a K light distribution much like that seen in redshifted [OII] 3727 Å, while emission at J is more similar to that in broad band R. It may be difficult to account for the infrared emission in terms of young stars whose formation is triggered by radio jets. We find B2 0902+34 to be substantially fainter at K than reported by Lilly (*Ap.J. Lett.* 333, L161, 1988), which reduces the minimum required age for this object.