

[GC01] A Global 86 GHz VLBI Survey of Compact Radio Sources

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We present results from a large global VLBI(Very Long Baseline Interferometry) survey of compact radio sources at 86 GHz which started in October 2001. The main goal of the survey is to increase the total number of objects accessible for future 3mm-VLBI imaging by factors of 3 ~ 5. The survey data reach the baseline sensitivity of ~ 0.1 Jy, and image sensitivity of better than 10 mJy/beam. To date, the total of 127 compact radio sources has been observed. The observations have yielded images for 109 sources, and only 6 sources have not been detected. Flux densities and sizes of core and jet components of all detected sources have been measured using Gaussian model fitting implemented in DIFMAP. From these measurements, brightness temperature have been estimated, taking into account resolution limits of the data. We compare here the brightness temperatures of the cores and secondary jet components with similar estimates obtained from surveys at longer wavelengths (e.g. 15 GHz). This approach will be used to study questions related to mechanisms of initial jet acceleration(accelerating or decelerating sub-pc jets?) and jet composition(electron-positron or electron-proton plasma?).

[GC02] Luminosity Profiles of dE and dS0 Galaxies in the Virgo Cluster

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We investigated the structural parameters of a sample of 30 dwarf galaxies (15 dEs and 15 dS0s) in the Virgo Cluster using i-band images from the Sloan Digital Sky Survey Data Release 4. Among 28 galaxies for which surface brightness profiles were derived from ellipse fittings, 23 galaxies had a single component that was adequately described by a generalized Sersic function with a shape parameter ranging from $n=0.5$ to 2, while 5 galaxies (2 dEs and 3 dS0s) had bulge and disk components that were fitted by a generalized Sersic function and an exponential function, respectively. Since the majority of dwarf galaxies in the present sample had a single component, it seems likely that genuine dS0 galaxies that have disk and bulge components are quite rare in the Virgo Cluster. The similarity in structural parameters of genuine dS0 galaxies in the Virgo Cluster with those of Magellanic-type galaxies implies that the progenitors of dwarf lenticular galaxies in the Virgo Cluster were most likely Magellanic-type galaxies if dS0s are harassed late-type spirals.