[구GC-18] Change of Intrinsic Brightness Temperatures of Compact Radio Jets

Sang-Sung Lee
Korea Astronomy and Space Science Institute

We present results of our investigation of intrinsic brightness temperatures of compact radio jets at radio frequencies. The intrinsic brightness temperatures of about 100 compact radio jets at 2, 5, 8, 15, and 86 GHz are estimated based on large VLBI surveys conducted in 2001-2003 (or in 1996 for the 5 GHz sample). The multi-freqeuncy intrinsic brightness temperatures of the sample of the jets are determined with a statistical method relating the observed brightness temperatures with the maximal apparent jet speed, assuming one representative intrinsic brightness temperature for the sample at each observing frequency. With investigating the observed brightness temperatures at 15 GHz in multiple epochs, we found that the determination of the intrinsc brightness temperature for our sample is affected by variability of individual jets in flux density at the time scales of a few years. This implies an importance of contemporaneity of the multi-frequency VLBI observations for the statistical method. Since our analysis is based on the VLBI observations conducted in 2001-2003, the results are less affected by the flux density variability. We found that the intrinsic brightness temperature T0 increases as $T_0 \propto \nu^{\epsilon}$ with $\epsilon \approx 0.7$ below a critical frequency $\nu_c \approx 10$GHz where energy losses begin to dominate the emission, and above the critical frequency, T_0 decreases with $\epsilon \approx -1.2$ supporting for the decelerating jet model.

[구GC-19] Red AGNs becoming normal AGNs

Dohyeong Kim[1], Myungshin Im[1], E. Glikman[2], Jong-HakWoo[1], T. Urrutia[3]
[1]*Seoul National University, KOREA,* [2]*Middlebury College, USA,*
[3]*Leibniz-Institut für Astrophysik Potsdam, GERMANY*

Red active galactic nuclei (AGNs) are supposed to be transitional objects becoming normal AGNs in the galaxy evolution scenario. So far, ~200 red AGNs have been found by very red color in optical through NIR wavelength (e.g., r'-K >5 and J-K >1.3; Urrutia et al. 2009). Here, we compare nuclear activities of the red AGNs to those of normal AGNs to verify the evolutionary phase of the red AGNs. In order to study the nuclear activities of the red AGNs, we use broad emission lines of Pβ (1.28 μm) of which flux is less suppressed by a factor of 100 than the Hβ line in the case of the red AGNs with a color excess of E(B-V)=2 mag. We use 16 red AGNs discovered in previous red AGN surveys by using SDSS, 2MASS, and FIRST (Glikman et al. 2007; Urrutia et al. 2009) at z ~0.7 for which Pβ lines are redshifted to the sky window at ~2.2μm. The mean Eddington ratio of the 16 red AGNs is 0.562, and that of the normal AGNs is 0.320, which indicates the red AGNs include more active black hole (BH) than the normal AGNs. To test how significantly the nuclear activities of the red AGNs and the normal AGNs are different, we perform a two-dimensional Kolmogorov-Smirnov test (K-S test) on their Eddington ratio distributions. The K-S test shows the maximum deviation between the cumulative distributions, D, is 0.48, and the probability of null hypothesis, p, is even less than 0.001. This result is consistent with a picture of that the red AGNs are in intermediate phase between the stage of merger-driven starburst galaxy and the normal AGN.