[구GC-21] Compact radio jets on sub-parsec scales

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The VLBI cores of the compact radio sources are optically thick at a given frequency. The distance of the core from the central engine is inversely proportional to the frequency (Koenigl1981). Under the equipartition condition between the magnetic field energy and particle energy density, the absolute distance of the VLBI core can be predicted. From the database of VLBI surveys at lower frequencies (2, 8, 15, and 43GHz) and that of the 3mm VLBI survey (Lee et al. 2008), the brightness temperatures in the rest frame are investigated in the sub-parsec regions of the compact radio sources. From the vicinity of the central engine, the brightness temperatures increase slowly and then rise with steeper slope. This implies that the jets are collimated and accelerated by the magnetically driven force, as predicted by Vlahakis and Koenigl (2004).

[구GC-22] Cosmological Parameter Estimation from Large Scale Structure Topology

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We present a method to constrain cosmological parameters using the topology of large scale structure (LSS). We use thegenus statistic as a measure of topology and try smoothing scales greater than 15 h^-1 Mpc. Using an N-body simulation of the growth of LSS in the lambda CDM universe, we calculate genus of cold dark matter and dark matter halo distributions in real and redshift spaces, which would reflect effects of bias, non-linear gravitational evolution and redshift distortion on LSS topology. We find that at the scales larger than about 15 h^-1Mpc the genus of LSS is in very good agreement with that predicted by the linear theory. The genus amplitude of DM halo is also found consistent with that calculated from the luminous red galaxies in the SDSS. We compare our results with comological parameter estimation by WMAP3.