

measurement of the disk thicknesses and the derived radial profiles of gas and stars, we estimate the corresponding volume densities. The gravitational instability parameter Q follows a fairly uniform profile with radius and is ≥ 1 across the star-forming disk. The star formation law has a slope that is significantly different from those found in more face-on galaxy studies. The midplane gas pressure appears to roughly hold a power-law correlation with the midplane volume density ratio ($\rho_{\text{H}_2}/\rho_{\text{HI}}$).

[ㄱ GC-07] The Virial Relation and Intrinsic Shape of Elliptical Galaxies

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Early-type galaxies (ETGs) are supposed to follow the virial relation $M \sim \sigma^2 * R_e$, with M being the galaxy mass, σ being the stellar velocity dispersion, and R_e being the (2D) effective radius. I apply this relation to (a) the ATLAS3D sample and (b) the sample of Saglia et al. (2016). The two datasets reveal a statistically significant tilt of the empirical relation relative to the theoretical virial relation such that $M \sim (\sigma^2 * R_e)^{0.92}$ with zero intrinsic scatter. This tilt disappears when replacing R_e with the semi-major axis of the projected half-light ellipse, a . Accordingly, a , not R_e , is the correct proxy for the scale radius of ETGs. By geometry, this implies that early-type galaxies are axisymmetric and oblate in general, in agreement with recent results from modeling based on kinematics and light distributions.

[ㄱ GC-08] KOREAN VLBI NETWORK CALIBRATOR SURVEY (KVNCS): 1. SINGLE DISH FLUX MEASUREMENT IN THE K AND Q BANDS

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We present the catalog of the KVN Calibrator Survey (KVNCS). This first part of the KVNCS is a single dish radio survey conducted at 22 (K band) and 43 GHz (Q band) simultaneously using the Korean VLBI Network (KVN) from 2009 to 2011. A total 2045 sources selected from the VLBA Calibrator Survey (VCS) with an extrapolated flux limit of 100 mJy at K band. The KVNCS contains

1533 sources in the K band with a flux limit of 70 mJy and 553 sources in the Q band with a flux limit of 120 mJy; it covers the whole sky down to $-32.^\circ 5$ in declination. Five hundred thirteen sources were detected in the K and Q bands, simultaneously; $\sim 76\%$ of them are flat-spectrum sources ($-0.5 \leq \alpha \leq 0.5$). From the flux-flux relationship, we anticipated that the most of the radiation of many of the sources comes from the compact components. Therefore, the sources listed in the KVNCS are strong candidates for high frequency VLBI calibrators.

[ㄱ GC-09] MASK: Multi-frequency AGN Survey with the KVN

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Available VLBI sources at high frequencies (e.g. $>22\text{GHz}$) are very limited - mainly due to atmospheric fluctuations that degrade coherence time and a power-law energy distribution of particles in case of AGNs. However, simultaneous multi-frequency VLBI receiving system of the Korean VLBI Network (KVN) and its powerful VLBI phase calibration technique offer benefits in finding more weak sources at millimeter wavelengths. Based on this aspect, multi-frequency AGN survey with the KVN (MASK) project, which aims to densify an existing a VLBI catalog of extragalactic radio sources at 22/43/86/129GHz is proposed as a KVN legacy program.

We selected 1220 sources of AGNs that include known VLBI sources and new fringe-detected sources using the KVN at K-band (22GHz). Among them, 138 sources were observed as pilot experiments at 22/43/86/129GHz simultaneously and excellent VLBI detection results are achieved. Therefore, we expect that MASK will open a new era in VLBI science at millimeter wavelengths by providing unprecedented number of available sources in the Universe.

[ㄱ GC-10] Discovery of Sub-pc Scale Plasma Torus in the Nearby Radio Galaxy 3C 84 with the KVN and VERA Array (KaVA)