[구GC-15] The Black Hole Mass - Stellar Velocity Dispersion Relation of Narrow-Line Seyfert 1 Galaxies

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Narrow-Line Seyfert 1 galaxies are arguably the most important AGN subclass in investigating the origin of the black hole mass-galaxy stellar velocity dispersion (MBH-σ) relation because of their high accretion rates close to the Eddington limit. Currently, it is still under discussion whether NLS1s are off from the local MBH-σ relation. We select a sample of 325 NLS1 at relatively low redshift ($z<0.1$) from the SDSS DR7 by constraining FWHM of Hβ in the range of 800-2,200 km/s. Among them, we measured stellar velocity dispersion of 40 objects which show strong stellar absorption lines, e.g. Mg b triplet(~5175Å), Fe(5270Å). In contrast, the other 285 objects show too weak stellar absorption lines to measure velocity dispersion. Using the sample of 40 objects with stellar velocity dispersion measurements, we investigate whether NLS1s follow the same MBH-σ relation as normal galaxies and broad line AGNs. We also test the reliability of the width of narrow lines as a surrogate of stellar velocity dispersion by comparing directly measured stellar velocity dispersion with σ inferred from [O III], [N II], [S II] line widths, respectively. We will discuss the connection between AGN activity in NLS1s and galaxy evolution based on these results.

[구GC-16] M101, Type Ia Supernova, and the Hubble Constant

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SNe Ia are a well-known powerful distance indicator. Type Ia supernova (SN) 2011fe was discovered in the nearby spiral galaxy M101 in 2011. It was discovered in less than one day after its explosion and is one of the nearest SNe Ia. Therefore SN 2011fe plays a significant role for calibrating the luminosity of the SNe Ia as well as for studying the progenitors of SNe Ia. However, previous estimates of the distance to M101 based on various methods show a large range. We present a new determination of the distance to M101 using the tip of the red giant branch (TRGB) method. We measure the distance from the F555W and F814W images of nine fields taken with the HST/ACS and HST/WFPC2 available in the HST archive. We derive a distance estimate with much smaller errors than previous studies. We discuss the implication of our results in relation with the calibration of optical and near-infrared maximum magnitudes of SNe Ia and the Hubble Constant.