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We explore the role of bars in AGN-galaxy co-evolution using a volume-limited face-on late-type galaxy sample with $M_r < -19.5$ and $0.02 < z < 0.055$ selected from SDSS DR7. In this study, we investigate how $SFR_{\rm fib}$ as a proxy of gas contents at galactic center (over 1~1.5 kpc bulge scale) and central stellar velocity dispersion, σ, of host galaxies are connected to the bar presence and AGN activity. We find that galaxies are distributed in three distinct regions over the $SFR_{\rm fib}-\sigma$ space and the behaviors of their bar fraction ($f_{\rm Bar}$) are clearly different for each region. Galaxies at the AGN dominant region tend to be gas-deficient as $f_{\rm Bar}$ increases and bars are more frequently found in fully-quenched late-type galaxies at the quiescent region, suggesting that bars speed up of the consumption of gas by SF and lead a sudden decline in the central gas. Overall, the bar effects on the AGN activity are positive over the same space except for quiescent galaxies with $\sigma > 170$ km s^{-1}. Most significant bar effect on the AGN activity occurs in the less massive galaxies having sufficient gas, whereas the effect on galaxies at the AGN dominant region with higher the AGN fraction is relatively small. We suggest that the bar affect both central SF and AGN activities, but differently for central gas amount and BH (or bulge) mass of galaxies. We also investigate the AGN-bar connection with only pure AGNs and then confirm that they give marginally the same results.

[구 GC-14] Constraining the shielded wind scenario in PG 2112+059

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The physical scenario describing the origin of quasar winds remains largely unsettled due to our failure to account for X-ray weak BAL quasars. We approach this problem by studying the relation between the inner part of the outflow which is likely to be shielding the X-ray emission and thereby helping to drive the UV winds characterised by broad absorption lines (BALs). In particular, we aim to probe the wind-shield connection in the highly X-ray variable BAL quasar PG 2112+059, which has exhibited periods of X-ray weakness and X-ray normality in the past. A set of two 20 ks Chandra observations and two contemporaneous HST observations, separated by at least eight months, combined with a nearly simultaneous archival Chandra-HST observation from 2002, afford us a unique opportunity to study the connection between the shield (which is thought to be responsible for the X-ray absorption) and the ionisation state of the wind (observed as UV BAL features; e.g., C IV and O VI lines) over various timescales.

[구 GC-15] The long-term centimeter variability of active galactic nuclei: A new relation between variability timescale and black hole mass

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We study the long-term radio variability of 43 radio bright AGNs by exploiting the data base of the University of Michigan Radio Astronomy Observatory (UMRAO) monitoring program. The UMRAO database provides high quality lightcurves spanning 25 - 32 years in time at three observing frequencies, 4.8, 8, and 14.5 GHz. We model the periodograms (temporal power spectra) of the observed lightcurves as simple power-law noise (red noise, spectral power $P(f) \propto f^{-\beta}$ using Monte Carlo simulations, taking into account windowing effects (red-noise leak, aliasing). The power spectra of 39 (out of 43) sources are in good agreement with the models, yielding a range in power spectral index (β) from ≈ 1 to ≈ 3. We find a strong anti-correlation between β and the fractal dimension of the lightcurves, which provides an independent check of the quality of our modelling of power spectra. We fit a Gaussian function to each flare in a given lightcurve to obtain the flare duration. We discover a correlation between β and the median duration of the flares. We use the derivative of a lightcurve to obtain a characteristic variability timescale which does not depend on the assumed functional form of the flares, incomplete fitting, and so on. We find that, once the effects of relativistic Doppler boosting on the observed timescales are corrected, the variability timescales of our sources are proportional to the black hole mass to the power of $\alpha = 1.70 \pm 0.49$ We see an indication for AGNs in different regimes of