

**[7GC-01] Environmental Dependence of Active Galactic Nucleus
Activity II. The Effects of Galaxy Interactions**

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Using the Sloan Digital Sky Survey Data Release 7, we study the dependence of the observed fraction of galaxies with an narrow-line active galactic nucleus (AGN) on morphology and luminosity of host galaxy, morphology of the neighbor, mass density defined by nearest neighbor, and large-scale background mass density, to understand how AGN activity is related to its environments. We found that the fraction of galaxies hosting an AGN depends strongly on morphology together with color, and very weakly on luminosity or stellar velocity dispersion of host galaxies. At the given host morphology and luminosity, the AGN activity are significantly affected by morphology of its neighbor when the target galaxy is located within a virial radius of the neighbor. Late-type neighbors enhance the AGN activity within the virial radius while early-type neighbors reduce it until the neighbor-separation reaches to merging scale. The result suggests that hydrodynamic interactions within the virial radius of the galaxy plus dark halo system during encounters play a significant role in the nuclear activity.

**[7GC-02] The new estimator of black hole masses in active galaxies
using near-infrared hydrogen line**

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We derive a new M_{BH} (mass of black hole) estimator using $\text{Pa}\alpha$ and $\text{Pa}\beta$ lines. Being in NIR, these lines are much less affected by dust extinction than conventional methods using optical spectra, therefore they are useful for studying dust reddened AGNs. The dust reddened AGNs occupy 15~ 50 percent population of AGNs and they are believed an early phase of AGN evolution or obscured by dust torus in the direction of line of sight. To obtain $\text{Pa}\alpha$ & $\text{Pa}\beta$ line fluxes and FWHMs, we used NIR spectra of nearby type 1 AGNs from Glikman et al.(2006) or Landt et al.(2007). Line fluxes and FWHMs of Paschen line correlate well with those of Balmer line, suggesting that Paschen lines can be used as a good M_{BH} estimator. Finally, we present formulas estimate BH masses using Paschen lines.