*Molecular Gas, Dust, and Star Formation in Galaxies*
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# Detecting Gas Outflows in Type-2 AGNs Selected from the Sloan Digital Sky Survey

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**Abstract.** Energetic outflow from active galactic nuclei (AGNs) may play a critical role in galaxy evolution (e.g., Silk & Rees 1998). We present a velocity diagnostic for detecting gas outflow in the narrow-line region of Type-2 AGNs using line-of-sight velocity offsets of the [O III] $\lambda$5007 and H$\alpha$ emission lines with respect to the systemic velocity of stars in host galaxies (See Figure 1). We apply the diagnostics to nearby galaxies at $0.02 < z < 0.05$, 3775 AGN-host and 907 star-forming galaxies as a comparison sample, which are selected from the Sloan Digital Sky Survey DR7. After obtaining a best-fit stellar population model for the continuum and a systemic velocity based on stellar lines, we subtract the stellar component to measure velocity offsets of each emission line. We find a sample of 169 AGN-host galaxies with outflow signatures, displaying a larger velocity shift of [O III] than that of H$\alpha$, as expected in a decelerating outflow model (Komossa *et al.* 2008). We find that the offset velocity of [O III] increases with Eddington ratio, suggesting that gas outflow depends on the energetics of AGN.

**Keywords.** galaxies: active — galaxies: ISM

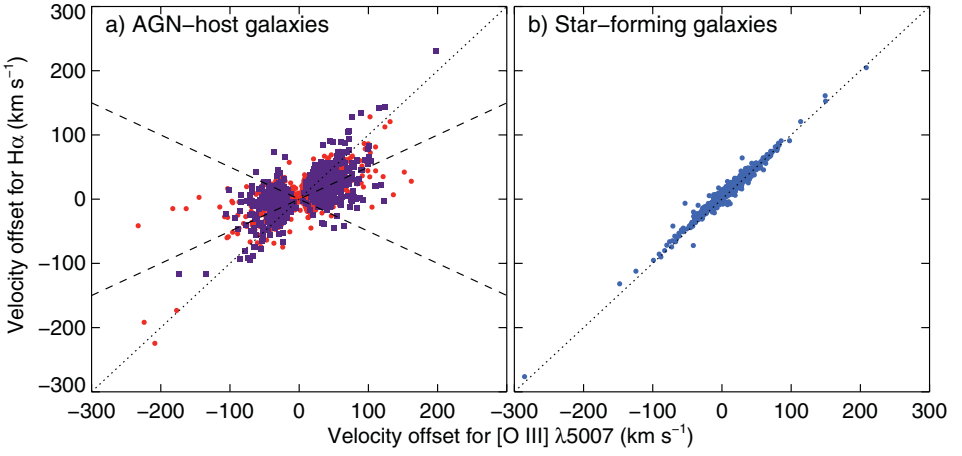


**Figure 1.** Velocity-offset diagnostic diagrams for a) AGN-host galaxies, i.e. Seyferts (circles) and LINERs (boxes), and b) star-forming galaxies, using velocity offsets for [O III] and H$\alpha$ lines with respect to the systemic velocity. In both panels, dotted lines indicate the same velocity offsets for both emission lines. The AGN-host galaxies galaxies within dashed lines are likely to exhibit an outflow, which is possibly due to a decelerating wind in the narrow-line region along the central black hole.

## References

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