# The Nature of Double-Peaked [O III] Active Galactic Nuclei

Hai Fu, Lin Yan, Adam D. Myers, Alan Stockton, S. G. Djorgovski, G. Aldering, Jeffrey A. Rich

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Active galactic nuclei (AGNs) with double-peaked [O III] lines are suspected to be sub-kpc or kpc-scale binary AGNs. However, pure gas kinematics can produce the same double-peaked line profile in spatially integrated spectra. Here we combine integral-field spectroscopy and high-resolution imaging of 42 double-peaked [O III] AGNs from Sloan Digital Sky Survey to investigate the constituents of the population. We find two binary AGNs where the line-splitting is driven by the orbital motion of the merging nuclei. Such objects account for only ~2% of the double-peaked AGNs. Almost all (~98%) of the double-peaked AGNs were selected because of gas kinematics; and half of those show spatially resolved narrow-line regions that extend 4-20 kpc from the nuclei. Serendipitously, we find two spectrally unresolved binary AGNs where gas kinematics produced the double-peaked [O III] lines. The relatively frequent serendipitous discoveries indicate that only ~1% of binary AGNs would appear double-peaked in Sloan spectra and 2.2_{-0.8}^{+2.5}% of all Sloan AGNs are binary AGNs. Therefore, the double-peaked sample does not offer much advantage over any other AGN samples in finding binary AGNs. The binary AGN fraction implies an elevated AGN duty cycle (8_{-3}^{+8}%), suggesting galaxy interactions enhance nuclear accretion. We illustrate that integral-field spectroscopy is crucial for identifying binary AGNs: several objects previously classified as "binary AGNs" with long-slit spectra are most likely single AGNs with extended narrow-line regions. The formation of extended narrow-line regions driven by radiation pressure is also discussed.

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