Spatially-Resolved Spectroscopy of SDSS J0952+2552: a Confirmed Dual AGN

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Most massive galaxies contain supermassive black holes (SMBHs) in their cores. When galaxies merge, gas is driven to nuclear regions and can accrete onto the central black hole. Thus one expects to see dual AGN in a fraction of galaxy mergers. Candidates for galaxies containing dual AGN have been identified by the presence of double-peaked narrow [O III] emission lines and by high spatial resolution images of close galaxy pairs. Spatially-resolved spectroscopy is needed to confirm these galaxy pairs as systems with spatially-separated double SMBHs. With the Keck 2 Laser Guide Star Adaptive Optics system and the OSIRIS near-infrared integral field spectrograph, we obtained spatially-resolved spectra for SDSS J09527.62+255257.2, a radio-quiet quasar shown by previous imaging to consist of a galaxy and its close (1.0") companion. We find that the main galaxy is a Type 1 AGN with both broad and narrow AGN emission lines in its spectrum, while the companion galaxy is a Type 2 AGN with narrow emission lines only. The two AGN are separated by 4.8 kpc, and their redshifts correspond to those of the double peaks of the [O III] emission line seen in the SDSS spectrum. Line diagnostics indicate that both components of the double [O III] emission lines are due to AGN photoionization. These results confirm that J0952+2552 contains two spatially-separated AGN. As one of the few confirmed dual AGN at an intermediate separation of < 10 kpc, this system offers a unique opportunity to study galaxy mergers and their effect on black hole growth.

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