

On the nature of type 2 quasars

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<https://doi.org/10.22201/ia.14052059p.2026.60.194>

Quasars and QSOs are the most luminous objects in the Universe, having bolometric luminosities $L_{\text{bol}} > 10^{46}$ erg/s produced by a Supermassive Black Hole (SMBH) with a high accretion rate in the nucleus of their host galaxies. The SMBH is surrounded by an accretion disk and emitting clouds with velocities in excess of 1000 km/s, surrounded by a dusty molecular torus at $\sim$ pc scales. In the Unified Model of AGN (Active Galactic Nuclei), this torus blocks the view of the inner region if observed “edge-on”, in the so-called type 2 QSOs. Type 1 QSOs, on the other hand, are supposed to be seen face-on and do not show obscuration. However, there has been some evidence suggesting that these two types of objects do not differ only due to orientation. The goal of this work is to investigate this for a QSO sample, comparing the optical spectral properties of QSO 1 with those of QSOs 2 using, in particular, the [O III] emission-line doublet for the quasar sample from SDSS DR 16, named DR16Q, to investigate a QSO 1 and 2 subsample within $0.4 < z < 0.5$. We found that the [O III] kinematic profile, traced by the W80 parameter, shows that the QSO 2 population has a broader profile than those for the QSOs 1. Moreover, the [O III] luminosity is higher for the QSOs 2 than for the QSOs 1. Both results suggest that there is a difference between these two QSO populations that cannot be fully explained by the AGN Unified Model. Our next step is to check if this difference persists up to $z = 1$ (when the [O III] doublet goes out of the SDSS wavelength range).

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