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The molecular gas content in obscured AGN at z >1

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The standard QSO-galaxy co-evolutionary scenario predicts a phase of deeply
"buried" supermassive black hole growth coexisting with a starburst (SB) before feedback phenomena deplete the cold molecular gas reservoir of the galaxy and an optically luminous QSO is revealed ("SB-QSO evolutionary sequence"). We tested simple SB-QSO paradigm predictions by comparing the molecular (carbon monoxide, CO) gas properties of 56 obscured and 49 unobscured QSO host galaxies at high-redshift (z ~ 1-6) with those of ~ 170 high-z star forming galaxies from the literature.
We found that, on average, obscured AGN at z >1 are associated with higher star formation efficiencies (SFEs) and lower gas fractions with respect to normal star forming galaxies and SBs at given stellar mass and redshift. These results could suggest that their cold gas content has been already depleted by powerful AGN-driven outflows. Moreover, we did not find any clear separation between the properties of unobscured and obscured QSOs (e.g. they have similar SFEs), suggesting a scenario where feedback can rapidly impact the host galaxy evolution.

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