

The Co-evolution of QSOs and Galaxies

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Abstract

Using two large samples of QSOs detected in the mid-infrared (MIR) with WISE, we show that their W2–W3 colors vary with redshift in a way that suggests the following trend of star formation in their host galaxies: from $z = 0$ to $z = 2.7$ star formation increases by a factor of 3, then stays constant up to $z = 4$, and decreases again at higher redshift. This behavior is slightly different from the best fits for the star formation history of field galaxies as deduced from the Optical-UV and IR, but is consistent with what is observed for submillimeter galaxies at high redshift.

Our results form the clearest evidence, so far, that the host galaxies of QSOs form their stars before field galaxies, and is in good agreement with the hierarchical biased structure formation paradigm.