

Lensed quiescent galaxies at $z \sim 2$: What quenched their star formation?

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Abstract. A key outstanding issue in galaxy evolution studies is how galaxies quench their star formation. I will present new results from our VLT/X-Shooter, ALMA and VLA campaign of a pilot sample of lensed quiescent massive galaxies at $z > 1.5$. Lensing magnification enables us to spatially resolve the stellar structure and kinematics of these compact galaxies, that are otherwise barely resolvable even with HST. Our deep X-Shooter spectra provided multiple absorption lines enabling strong constraints on their stellar populations, namely their star formation rates, ages, dispersions, and in some cases metallicities. Our complementary ALMA+VLA programme probes their molecular gas content through CO emission. All these observations provide unparalleled constraints on their quenching mechanisms. Our results indicate that quiescent galaxies at $z \sim 2$ (1) have short star formation timescales of a few hundred Myrs; (2) have a variety of stellar morphology from exponential disks to bulges; (3) are devoid of molecular gas; and (4) host low-luminosity active galactic nuclei which may be responsible for suppressing star formation. In addition to discussing the insights gained on quenching, I will highlight how these findings bring about new questions that can be addressed with future JWST and ALMA studies.
