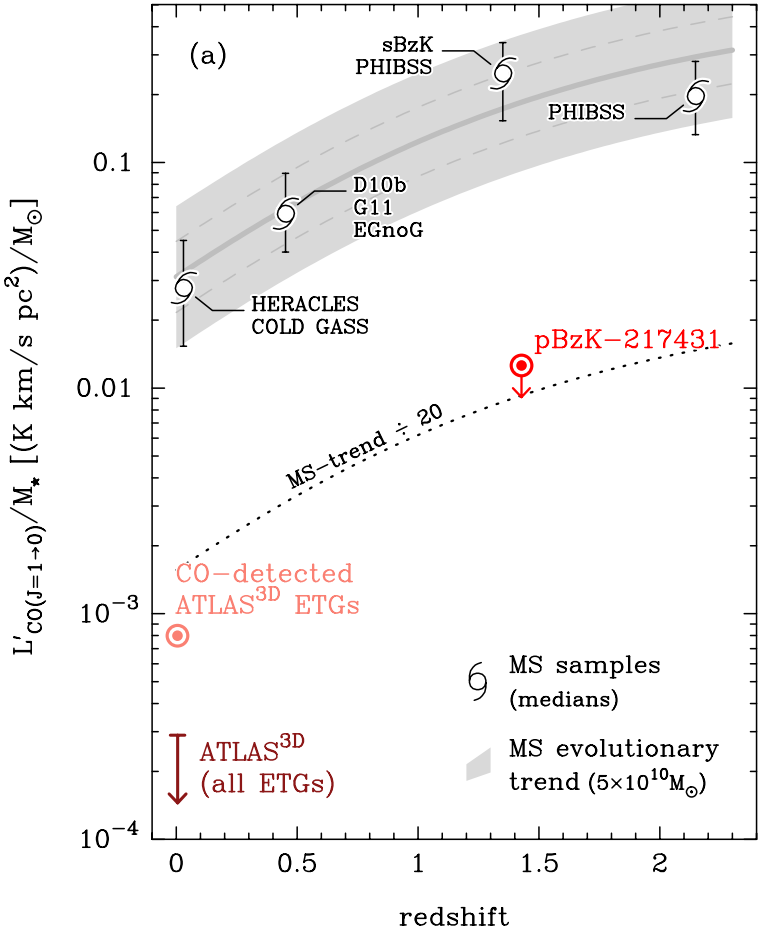
CO UPPER LIMIT FOR A MASSIVE z~1.5 ETG

CONSTRAINTS ON MOLECULAR GAS FRACTION

First order hypothesis:

- ISM conditions in low-z ETGs resemble those of local spiral galaxies (dense gas fractions, gas mass density, SFE, dust temperatures; Krips et al. 2010, Young et al. 2011, Crocker et al. 2012, Martig et al. 2013). Assume this applies also to pBzK-217431 (in accordance with high-res. simulations; Bournaud et al. 2014).

quantity/observable	value
R.A. [J2000]	$10^h02^m39.527^s$
Dec. [J2000]	$+01^d56^m59.12^s$
$z_{\rm spec}$	1.4277 ± 0.0015
$M_\star$ $[M_\odot]$	$6.6^{+0.5}_{-1.9}\times10^{11}$
r_e [kpc]	7.19 ± 1.95
Sérsic index n	3.8 ± 0.6
rms/40 MHz [mJy]	0.33
$I_{\rm CO(J=2\rightarrow1)}$ [Jy km/s]	$<0.30\sqrt{\left(\frac{\Delta v}{777\,\rm km/s}\right)}$
$L'_{\rm CO(J=2\rightarrow1)}$ [K km/s pc^2]	$<8.3\times10^9$
$M_{\rm mol.}$ $[M_\odot]$	$<3.6\times10^{10}\left(\frac{\alpha_{\rm CO}}{4.4}\right)$
$f_{\rm gas}$	$<5.1\%$



pBzK-217431 has a similar CO-deficit w.r.t. high-z disks as CO-detected ATLAS3D ETGs have w.r.t. local spirals.

This z=1.43 elliptical has a ~10× lower gas fraction than colour-selected (BzK- or BM/BX), CO-detected galaxies at the same redshift.