Lyman Break Galaxies at $1 \leq z \leq 3$ in "normal" and dense environments

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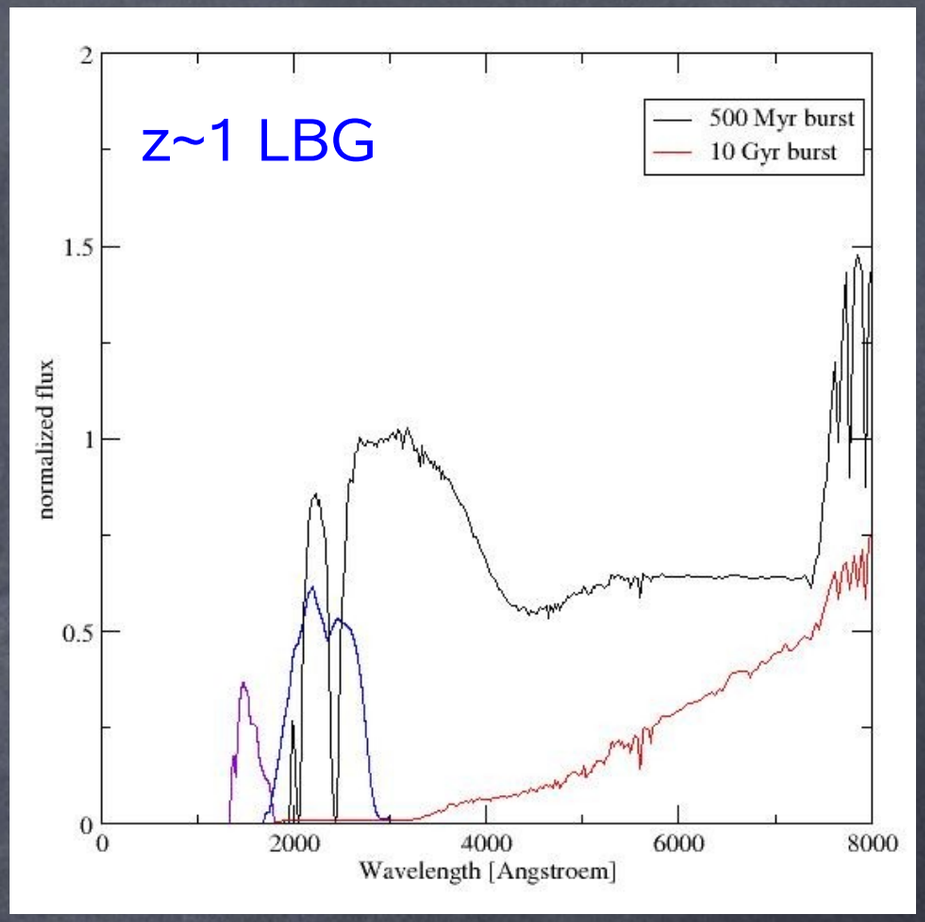
Importance of LBGs

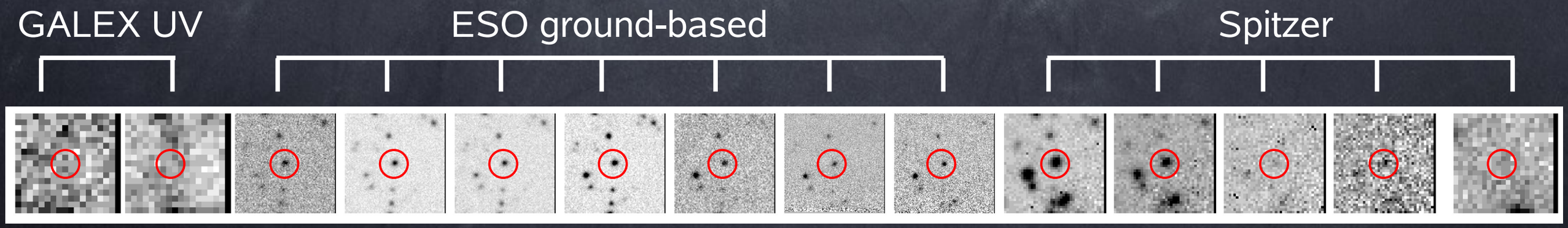
Lyman Break Galaxies: benchmark against other high-z galaxies (Steidel et al. 1993)

- allow study of galaxies selected in a consistent manner over z = 0.5-7

→ selection by depth of absorption of Lyman continuum

- Lyman Break selection adds bias: galaxies must actively form stars





z~1.8 LBG

ground- based only

z~5-6:

very young (~100 Myr), low mass (~10^9 $M_\odot$) LBGs (Verma et al. 2007)

~1% local mass density

compact "primordial" galaxies with <SFR>~40 $M_\odot yr^{-1}$

z~3:

10x more massive, hosting large part of SFR + dusty LIRGs (Shim et al. 2007)

only ~30% lower mass (10^9 $M_\odot$) systems (Verma et al. 2007)

LIRG type LBGs contribute significant to SFR density at this epoch

GALEX + u-band (ODI survey?)

z~3 → 1

complex population of LBGs with red (dusty, massive) and blue subpopulations

Lyman Break shifted in the UV at z~2.5

space based UV observations (GALEX) + ground-based u-band

GALEX

z~1:

first studies using FUV-dropouts

significant fraction of SFR hosted in red subpopulation

majority of LBG are disk-dominated and only few spheroids (Burgarella et al. 06)

ongoing significant interaction and merger activity

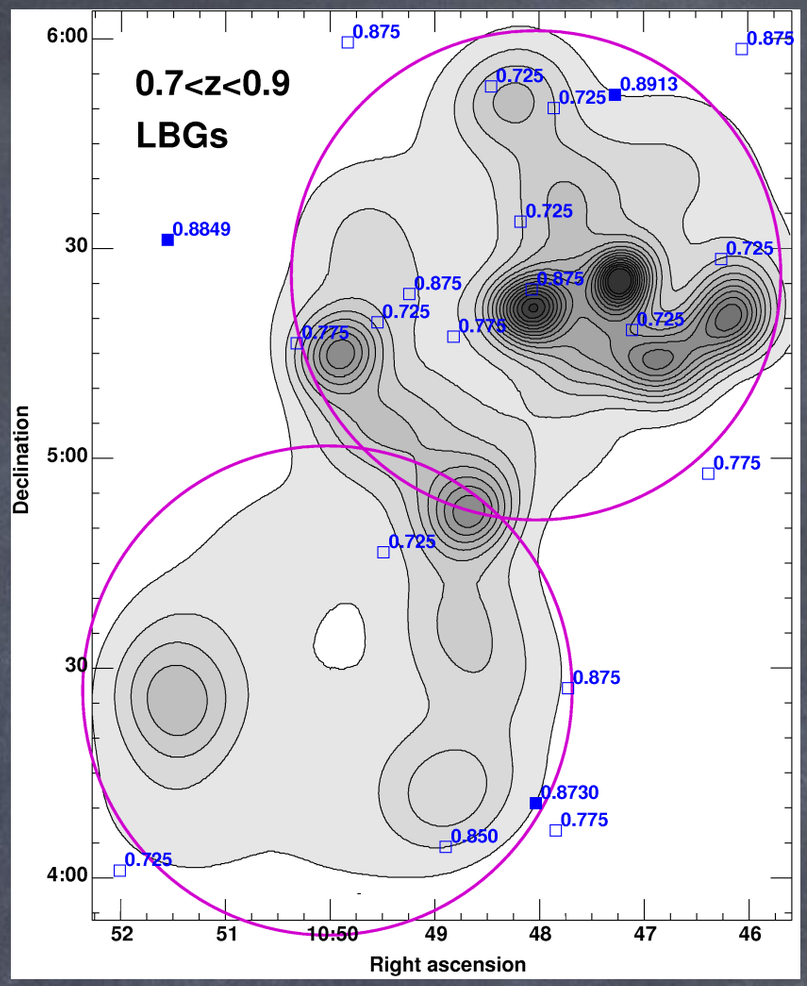
small fraction of SFR contributed by LBGs

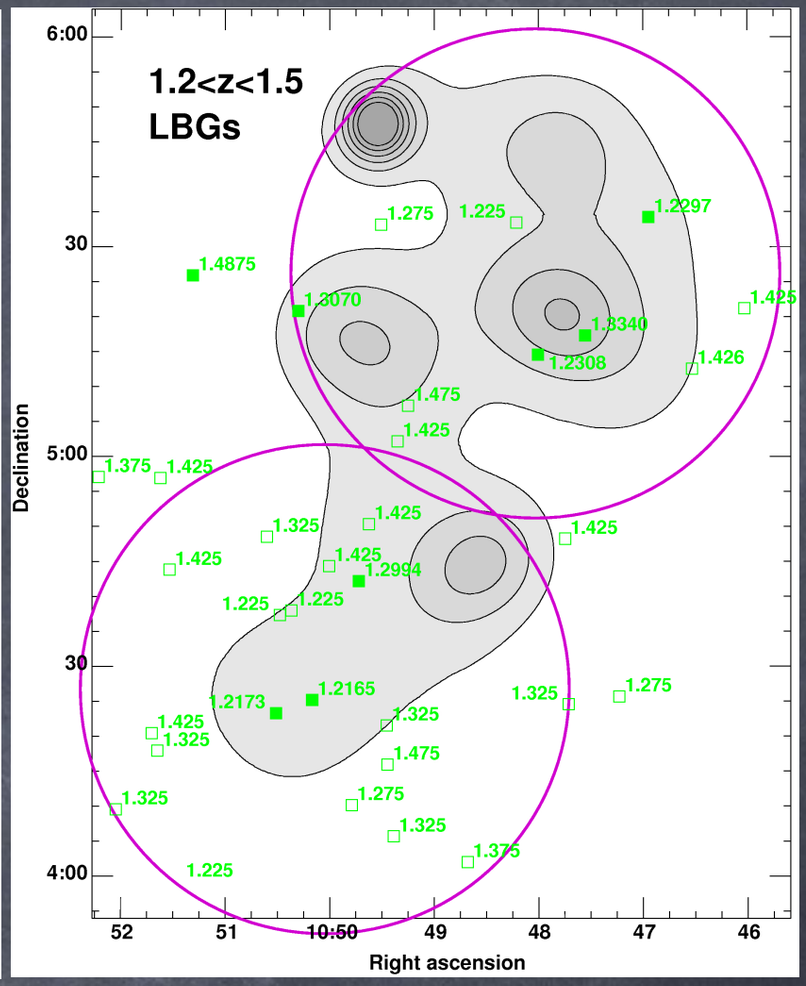
Clowes-Campusano LQG survey

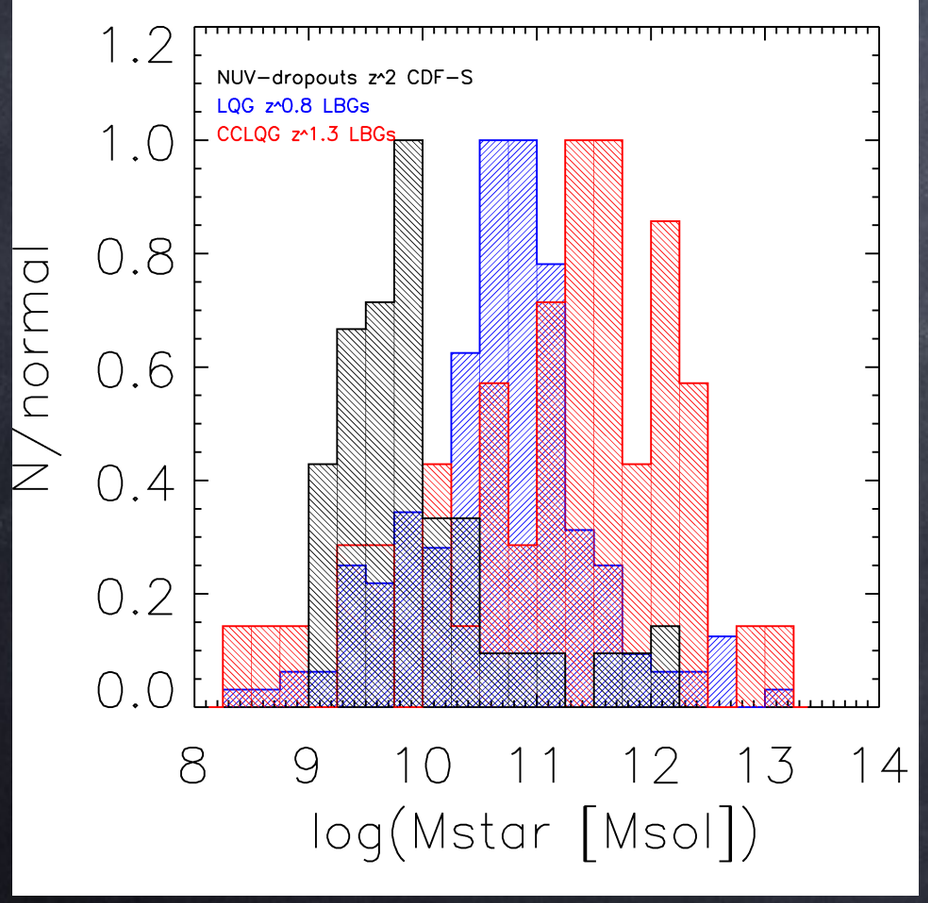
2 deg UV-optical-NIR survey:

target: LQGs at z~0.8 and z~1.3 (CCLQG)

data: 2x1deg GALEX FUV,NUV
+SDSS u,g,r,i,z
Bok-g,i,k,m,n
CFHT-r,z
KPNO+FLAMINGOS-J,Ks
Magellan+IMACS: MOS
~450 redshifts







FUV-dropouts at z~1 (Haberzettl et al. 2009)

~400 FUV dropouts with 0.5<z<1.5
~120 associated with z~0.8 LQG
~25 associated with z~1.3 CCLQG

- LBG distribution in z~0.8 LQG shows substructure with concentrations of LBGs in the northern field

LBGs@z~2 in the CDF-S:

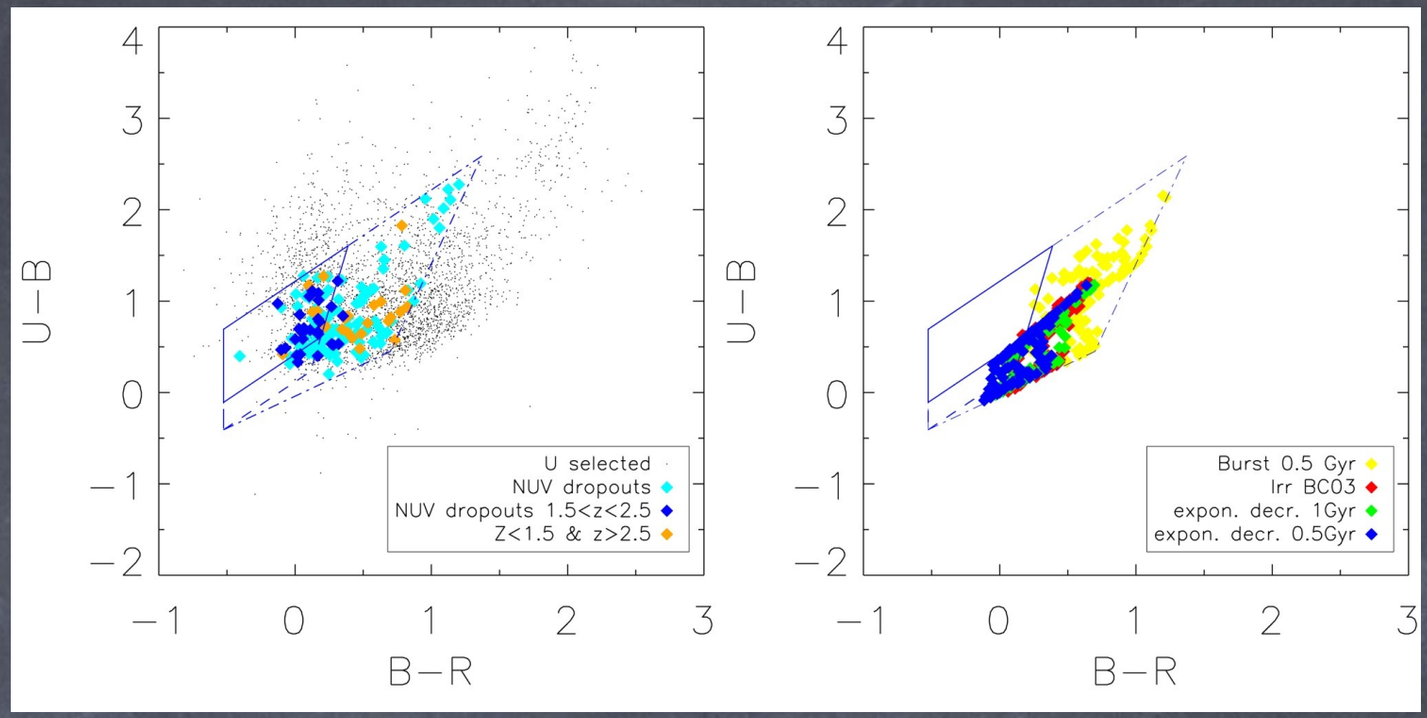
- GOODS optical, NIR, Spitzer + deep GALEX FUV-NUV

- model colors for SF galaxies with 1.5<z<2.5 ⇨ color selection criteria

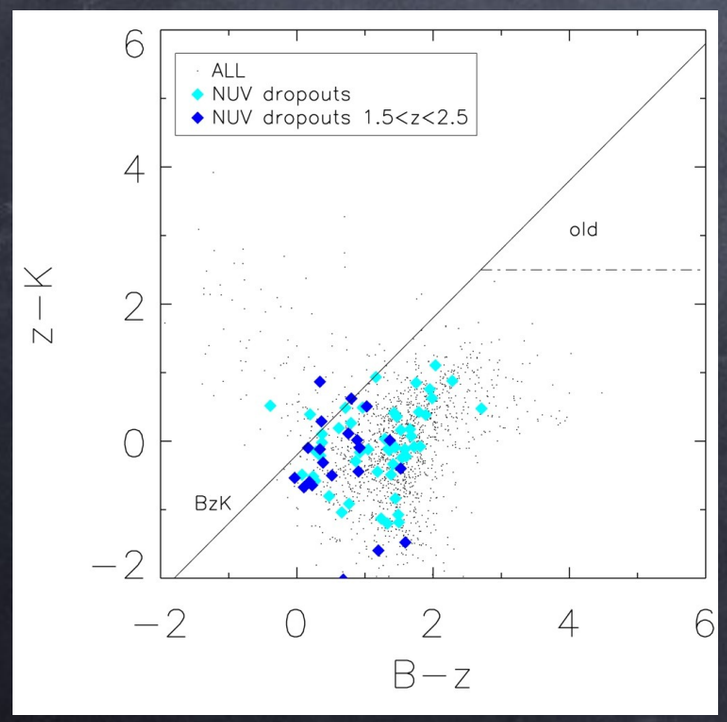
214 NUV dropouts (LBG cand.)

104 BM/BX overlap

3 BzK overlap



GOODS+VVDS spectroscopy



NUV dropouts: 79 z_{spec}

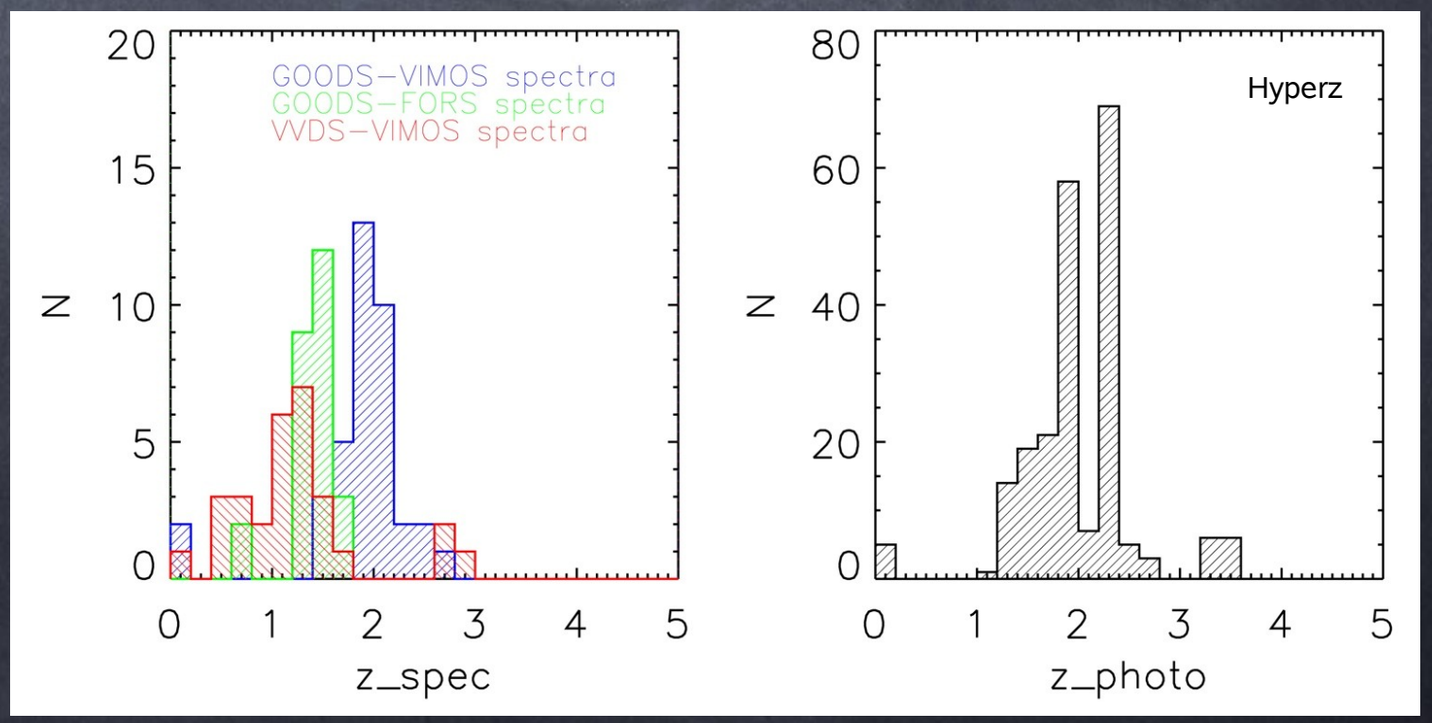
46 1.5<z<2.5

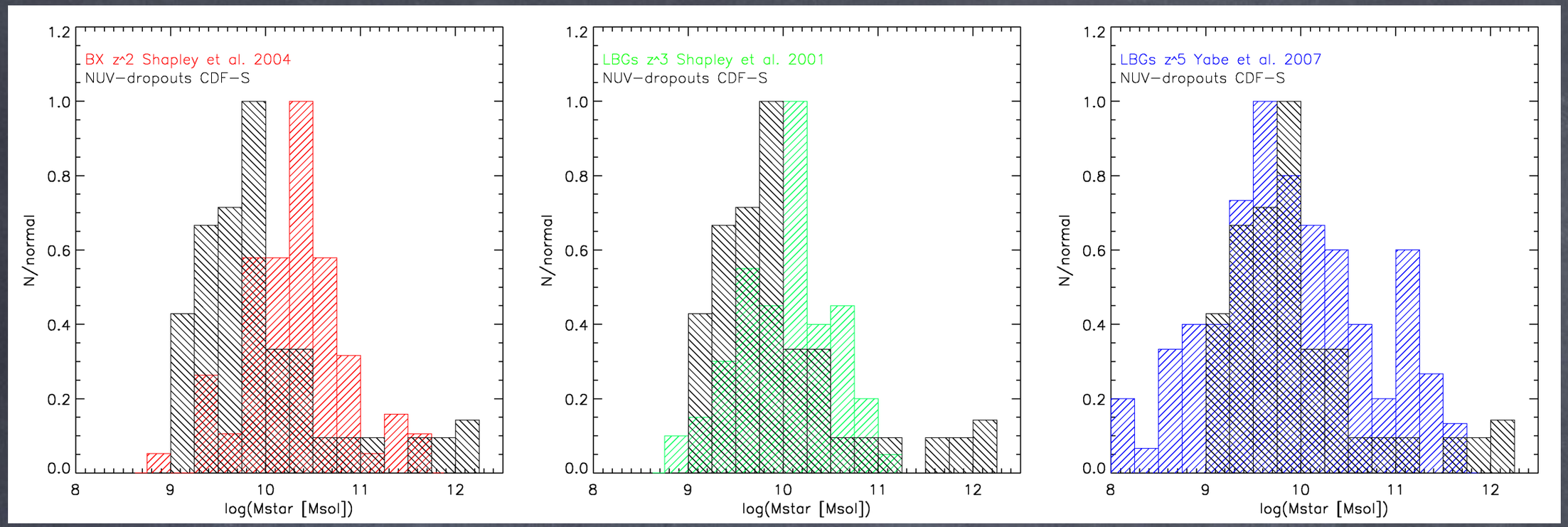
~60% efficiency

BM/BX: 140 z_{spec}

53 1.5<z<2.5

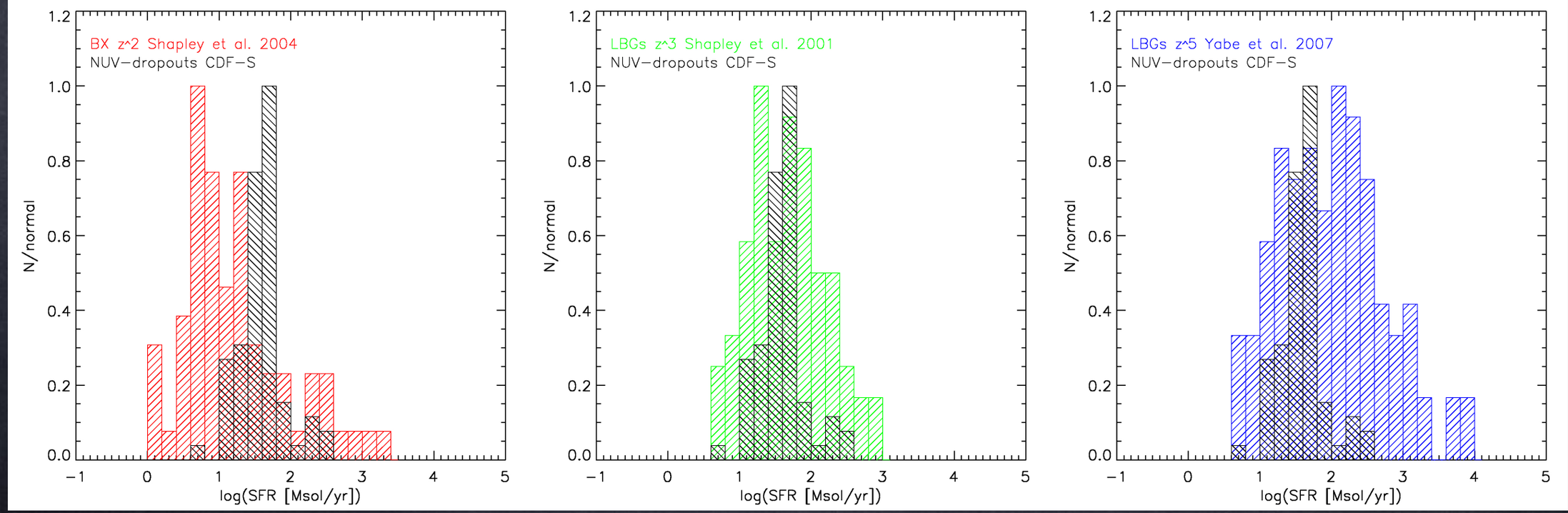
~40% efficiency





compare SED fits for z~2-5 star forming galaxies

stellar masses + SFR for z~2 LBGs from PEGASE models



Role of ODI?

- true Lyman break technique for z~2 LBGs using GALEX UV and ground-based u-band

- includes the lower end of mass distribution comparable to LBGs at z~5 and 3

- efficient: ODI matches GALEX field size well

expected to offer unmatched image quality for ground-based wide field images