The UDF05: First Results

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Lyman Break Technique in UDF05



- 5 band photometry: V, i, z, J, H
- Selection of galaxies from z = 5 10
- Interlopers:
 - Faint stars
 - Passive galaxies around z~1-2
- GOODS FORS2 spectroscopy contamination < 10% (Vanzella et al. 2006) for V- and i-dropouts

Redshift Selection Probabilities

$$N(m)dm = \int_0^\infty \phi(M[m,z])S(m,z)C(m)\frac{dV}{dz}dz dm$$



- Completeness simulations
- Redshift selection probability from simulations

V-dropouts:

- Replacing undetected fluxes with upper limits \rightarrow missing faint z>5.3 galaxies
- Impact of different model assumptions
 → 25 % variation in effective volume probed

z~5 LF in HUDF & NICP12



- 230 candidates down to 29.25/28.5
- Bright end \rightarrow SDF Yoshida et al. 2006
- Combined LF spans range of 5 mag
- Faint-end slope is $\alpha = -1.54 \pm 0.10$
- 25 % scatter expected from cosmic variance (Trenti & Stiavelli 2007)

•UDF V-drop sample 30 % under-dense w.r.t. NICP12 sample

•No evolution in faint-end from z~3 - 6

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z-dropouts in the UDF05+HUDF



- Search for z-dropouts in in 7.9 arcmin²
 2.1 of which are deeper than 28.2
- H-selected catalogs (> 5σ)
- 4 candidates for "conservative" selection



Evolution from z~6 to 7

- With no evolution of LF \rightarrow overpredict number of objects by factor of 2-3
- Fit gradual faintening of ≥ 0.4 mag in M_{*} per unit redshift (0.35 mag from z~4-6 Bouwens et al. 2007, and J. Dunlop's talk)
- $M^*(z=7) \ge -19.80$
- No candidates in deep pointings



First Conclusions from the UDF05

- No evolution seen in faint end of LF ($\alpha \sim -1.6$) z ~ 4 - 6
- Faintening of M_{*} as we move to higher redshifts
- Lack of galaxies at z>6
- No believable J-drops detected
- If this evolutionary trend is confirmed: extended epoch of reionization?

