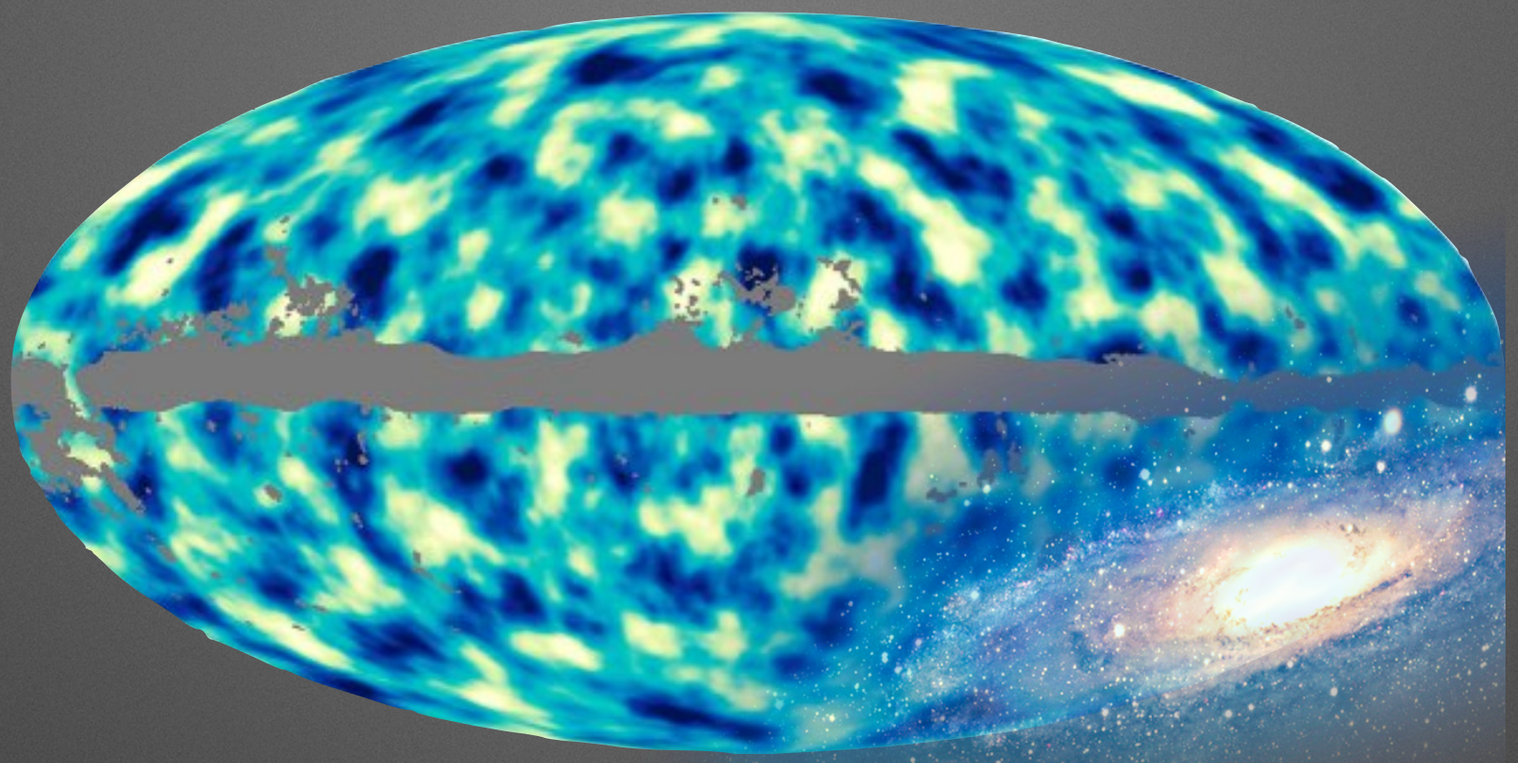
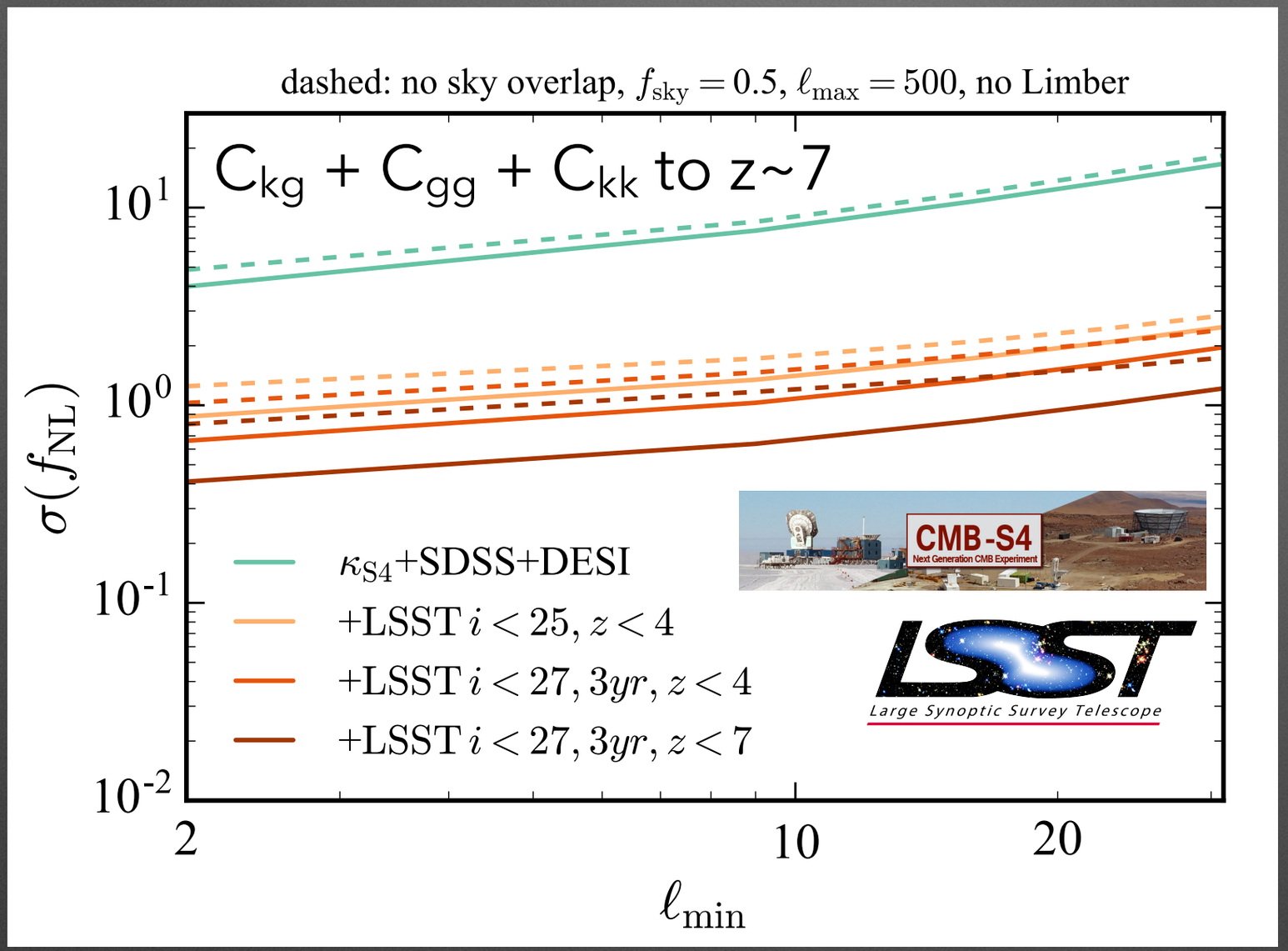
B-modes from space workshop, Berkeley, 12/04/17



Breaking up the lensing kernel

Michael J. Wilson and Martin White



Schmittfull & Seljak (2017), https://arxiv.org/abs/1710.09465

– Assuming LSST - CMBS4 overlap and white paper optimism for LSST n(z > 1), sample-variance cancellation with tomographic gg, κκ, gκ cross-spectra up to z~7 gives …

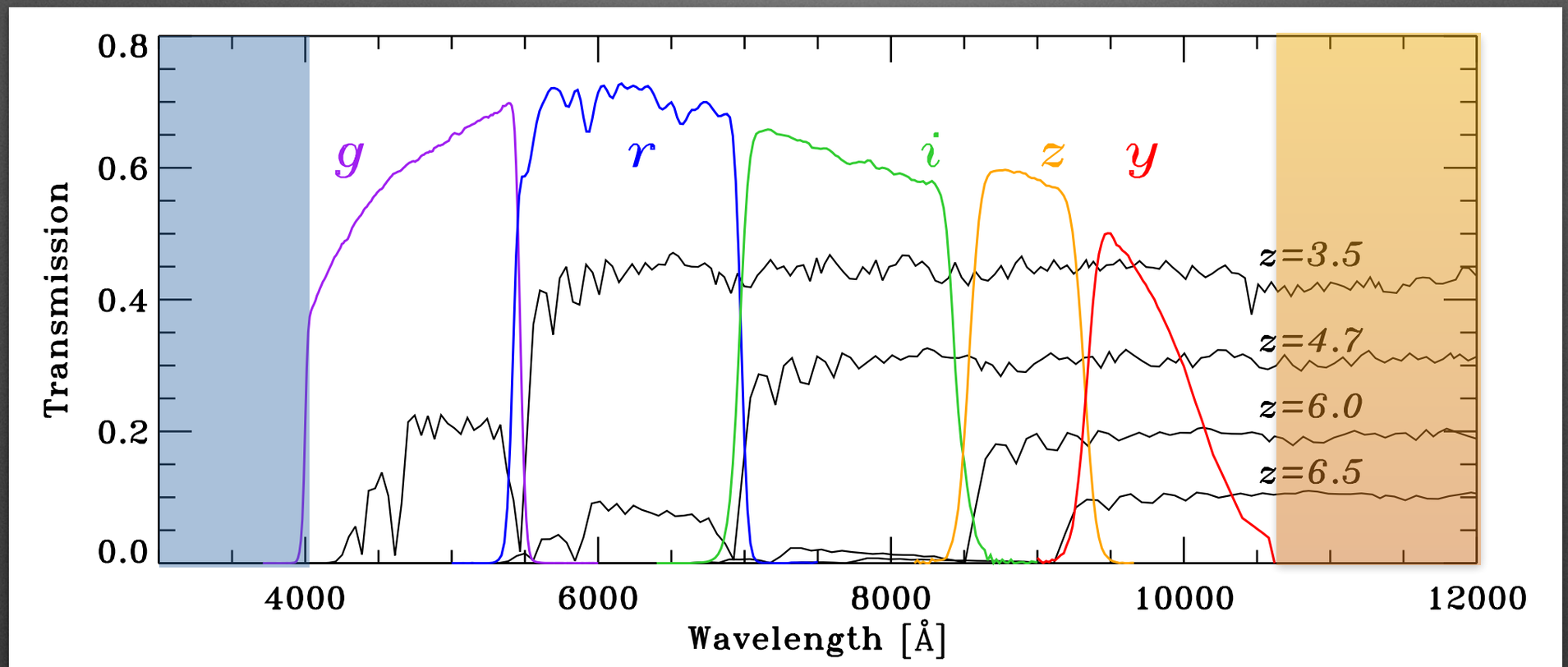
– $\sigma(f_{NL})$ ~ 1 and better, capable of challenging single-field inflation.
– 0.5% constraints on $\sigma_8(z)$ for 4 < z < 7; Unknown territory for dark energy /gravity.

– So, how practical is this forecast?

CLAUDS-U (20 deg²)

Hyper Suprime Cam - GOLDRUSH (100 deg²)

UKIRT-JHK (7.5 deg²)



Ono, Ouchi et al. (2017),
https://arxiv.org/abs/1704.06004

– HSC-GOLDRUSH: well-tested dropout selection of high-z Lyman break galaxies using colours or SED photo-zs; Guhathakurta et al '90, Steidel & Hamilton '92, Bowler et al '15.

– For CMB-S4, sufficient (superfluous) numbers assuming same-area GOLDRUSH dropouts

– **Schmittfull & Seljak assume essentially perfect photo-zs,** without uncertainties or catastrophic outliers.

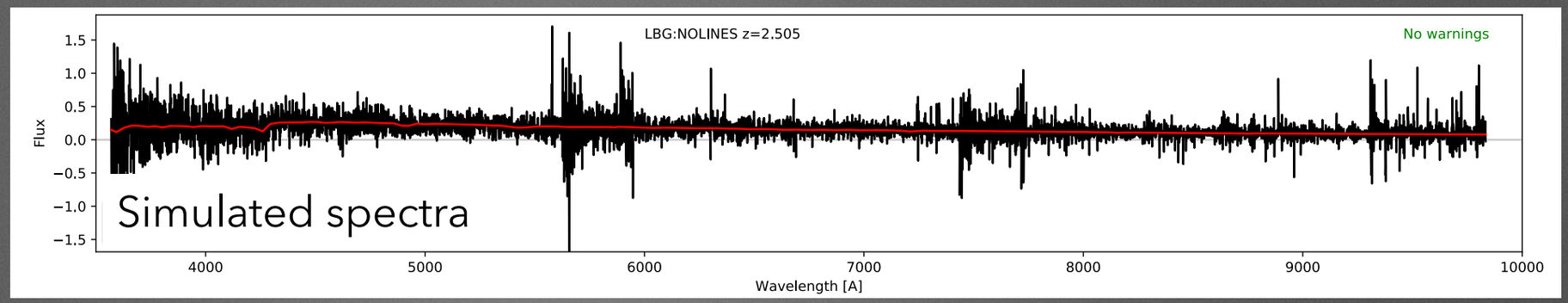
– In practice, we need

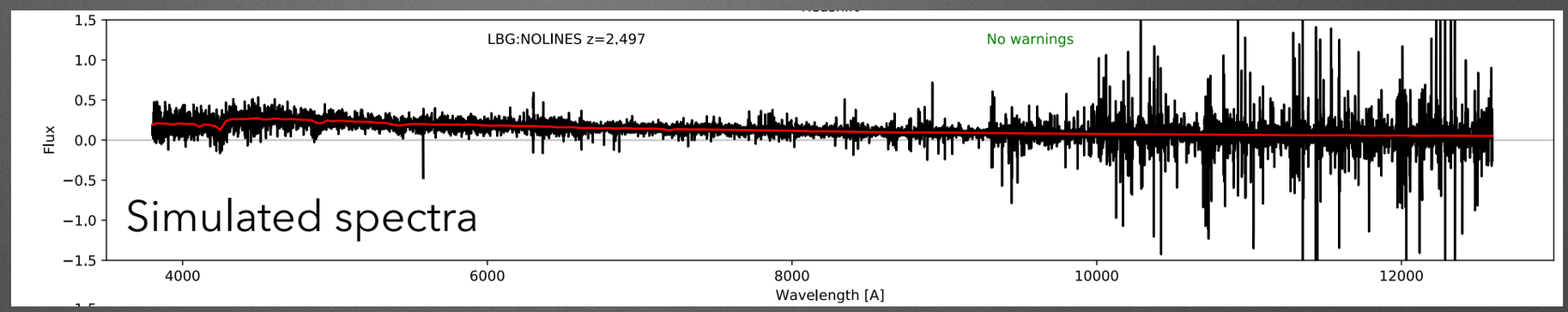
training for photo-z precision: machine learning & template fits require known spectra.

calibration for photo-z accuracy: clustering redshifts (arxiv:1302.0857) .

outlier rates for photo-z fidelity: GOLDRUSH contamination ~60% and greater.

– All three require **follow-up spectroscopy to be feasible**.





SpecSim – D. Kirkby & DESI collaboration
RedRock – S.Bailey & DESI collaboration

https://github.com/desihub/specsim
https://github.com/desihub/redrock

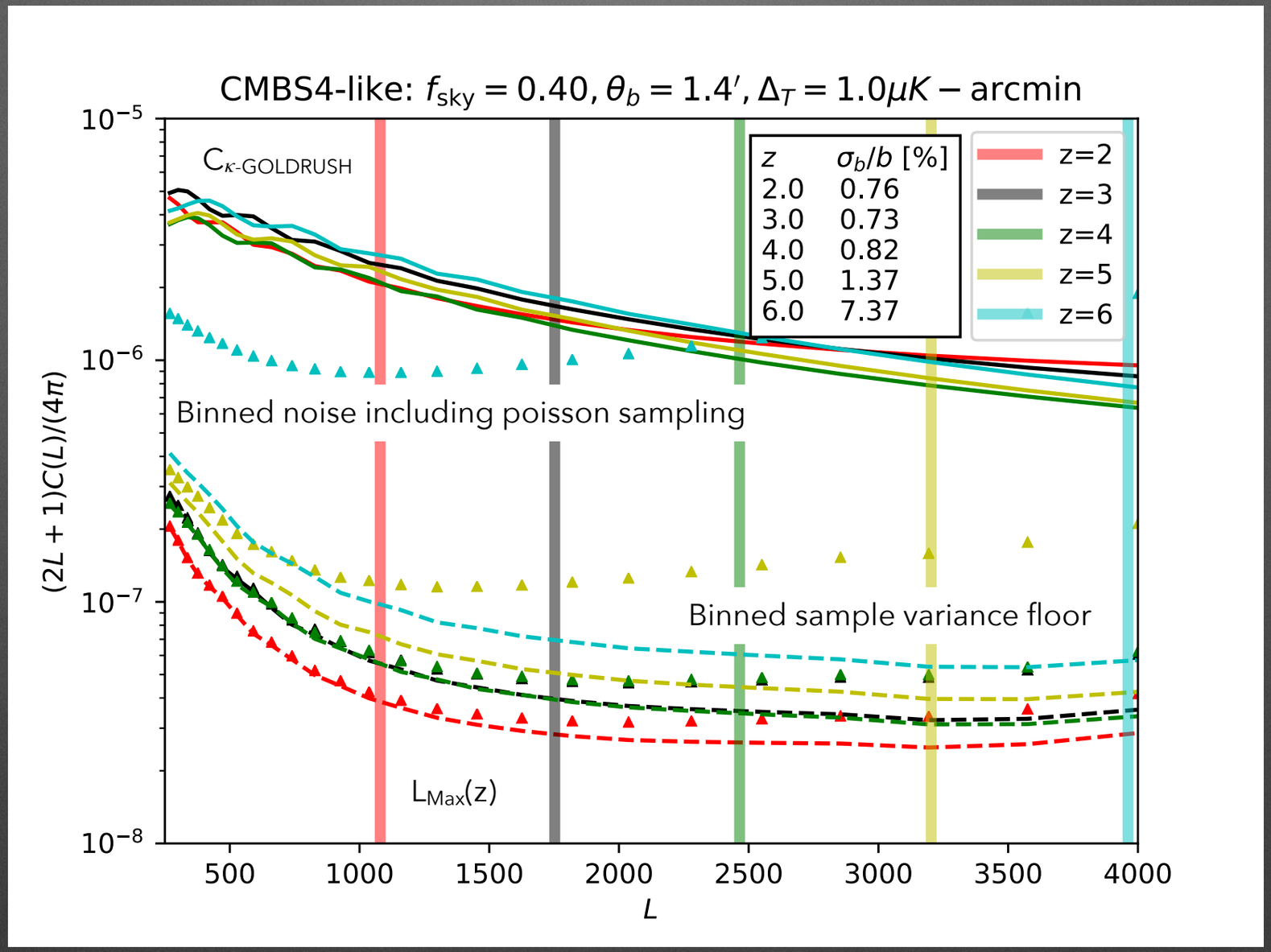
adapted for the Prime Focus Spectrograph, note the change in x-axis scale.

– DESI and PFS successfully redshift LBGs @ z ~ 2.5 with at most 2hr exposures (no emission lines).

– 8m Subaru + PFS near-IR coverage, 3.8 < λ / um < 12, tracks OII doublet to z~2.4
– Motivating factors for e.g. DESI-II in the South?

– Significantly stronger line emission of Lyman break galaxies @ z > 2 (Ly-a, SIII, OI, CII, CIV, …).
– For these, fainter galaxies are twice as likely to be emitters (arxiv: 1404.4632).

In summary …



mjwilson@lbl.gov

Poster available:
6:00 PM - 8:00 PM tomorrow

Thanks!