Mocking the PAU Survey (PAUS)

Lee Stothert – ICC Durham

With – Peder Norberg, Carlton Baugh, and the PAUS team

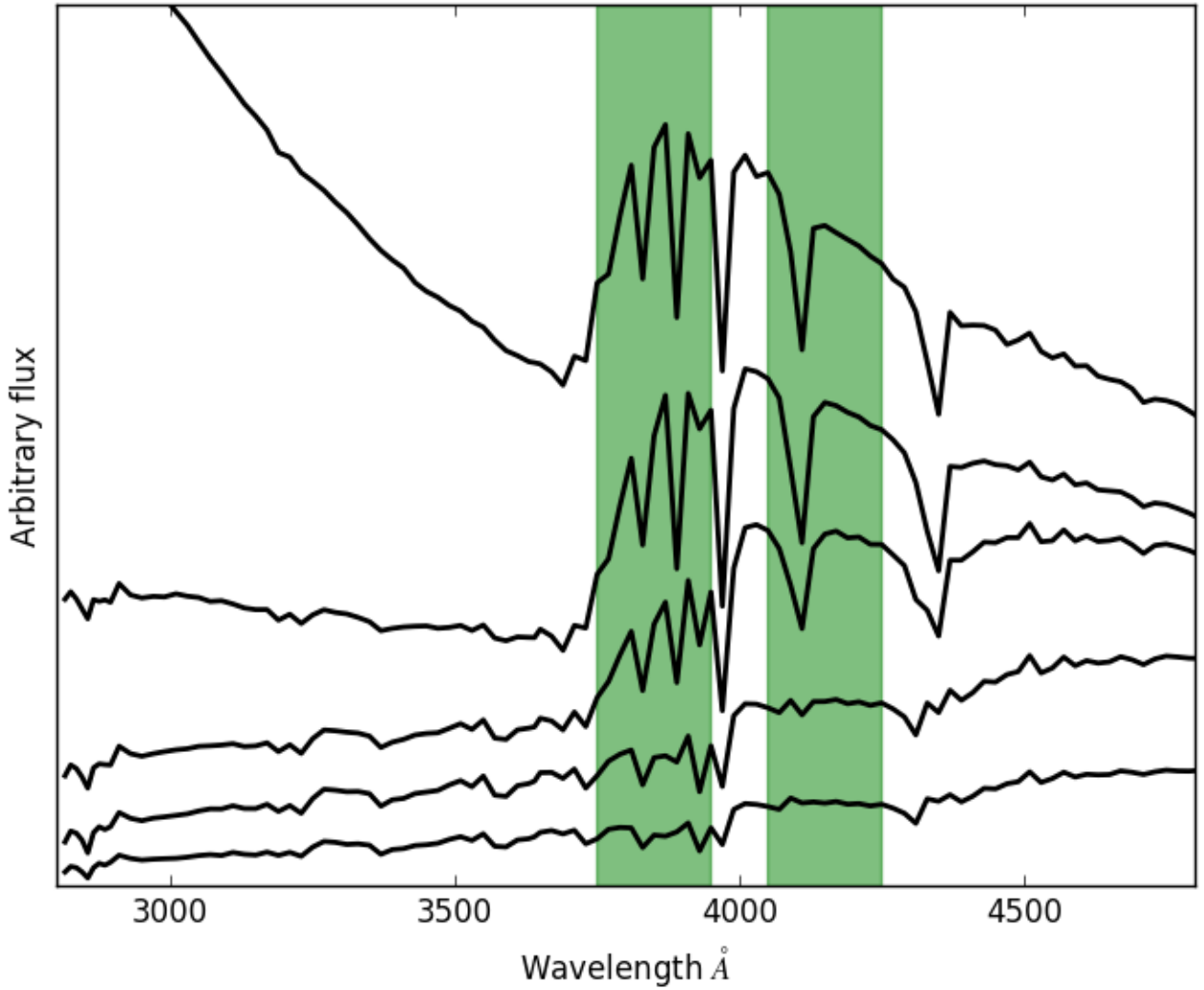
Durham University

ICC Institute for Computational Cosmology

PAU

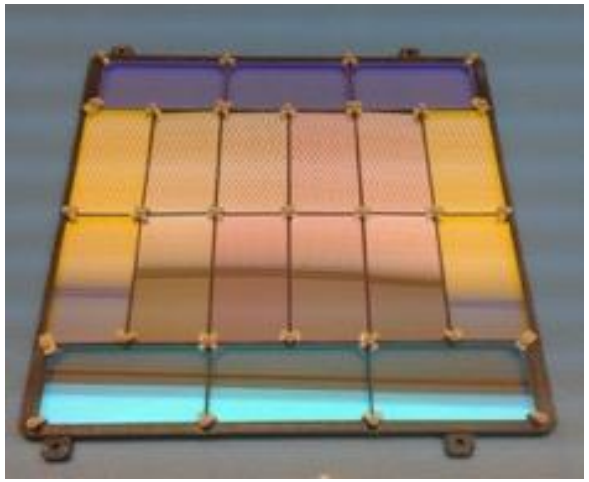
Constructing mock catalogues and testing the potential of PAUS narrow band photometry…

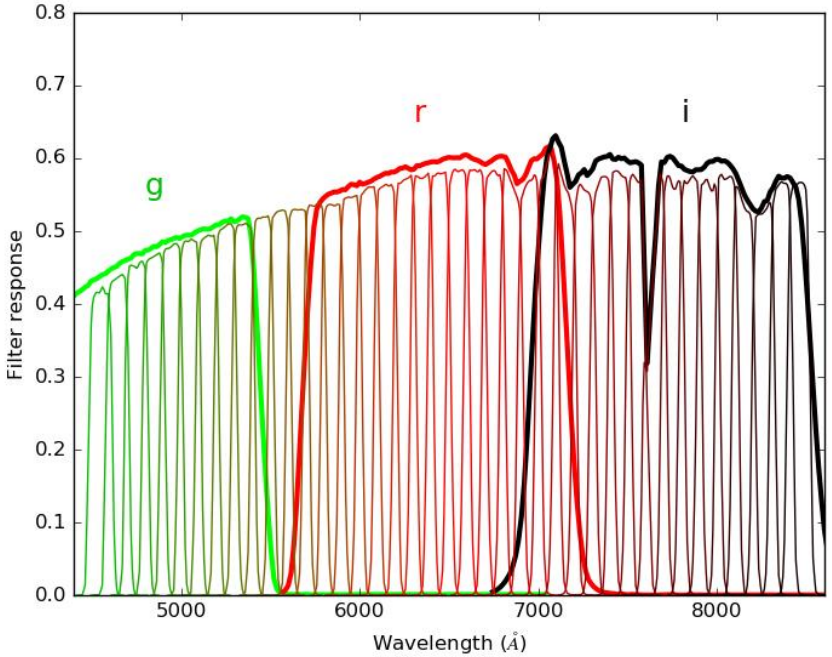
Just focus today on measuring the 4000Å break (D4000)



PAUCam & The PAU Survey

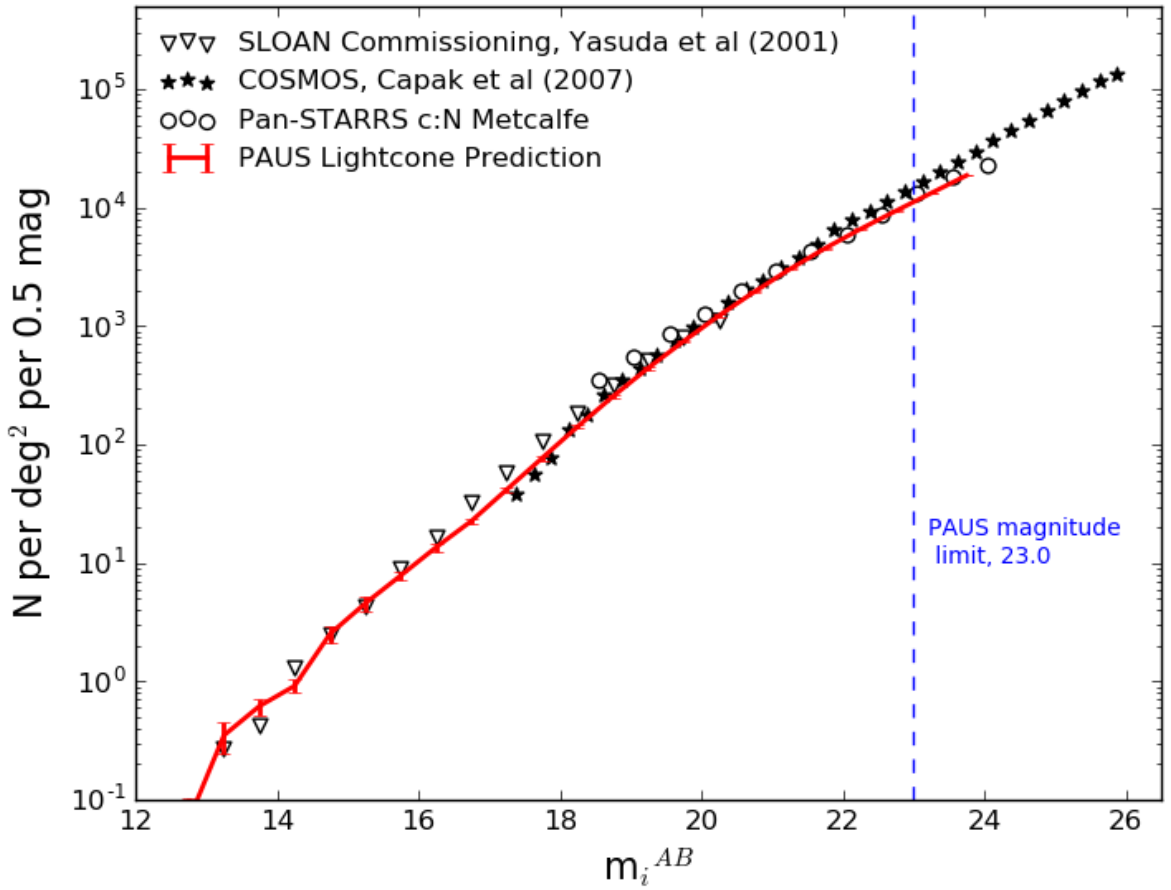
- PAUS – 100 sq deg, i < 23 galaxy redshift survey using PAUCam
- 40 Narrow bands covering g, r, i
- ~ 2 million Redshifts 0.1 < z < 1.0
- Aim: photo-z accuracy 0.35%
- 43 nights so far, 34% good conditions
- 25 nights in 2017A
- Long term survey status granted by Dutch & Spanish TAC

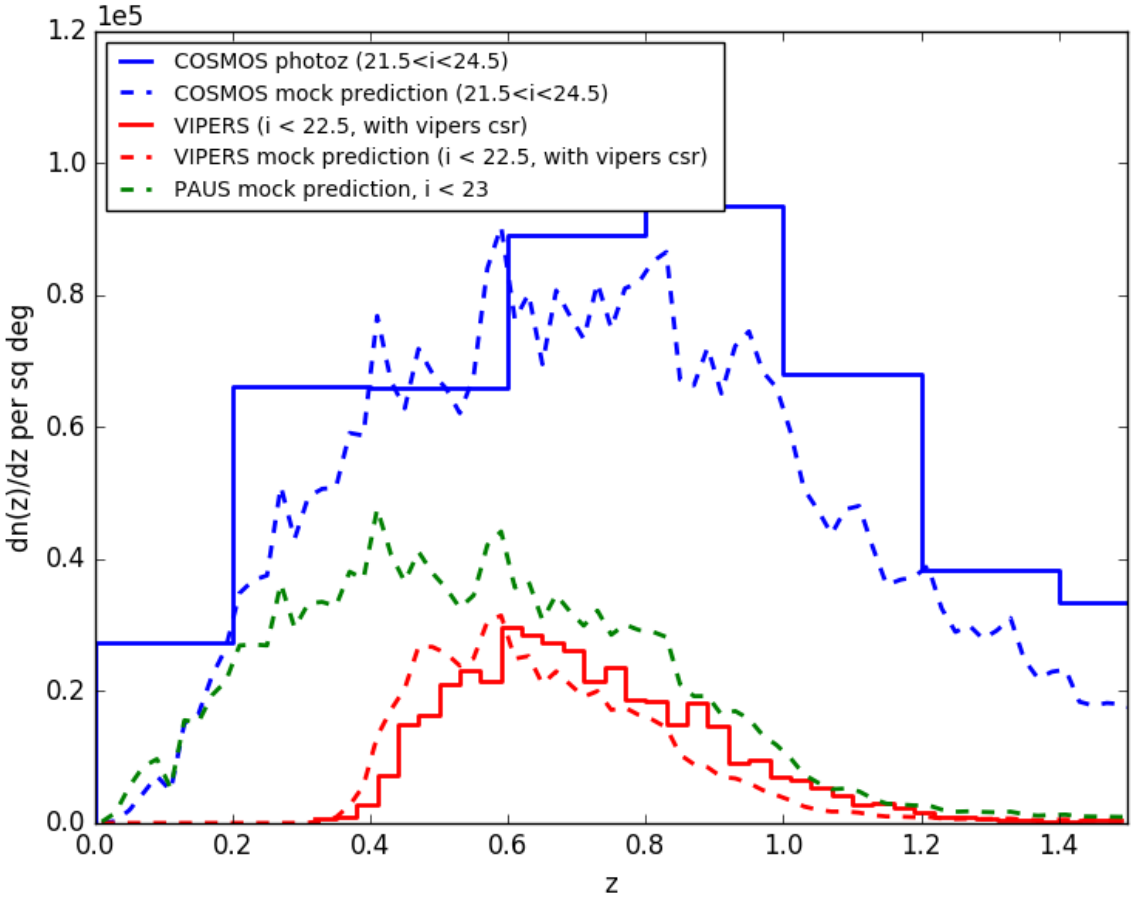




Mock PAUS Catalogue

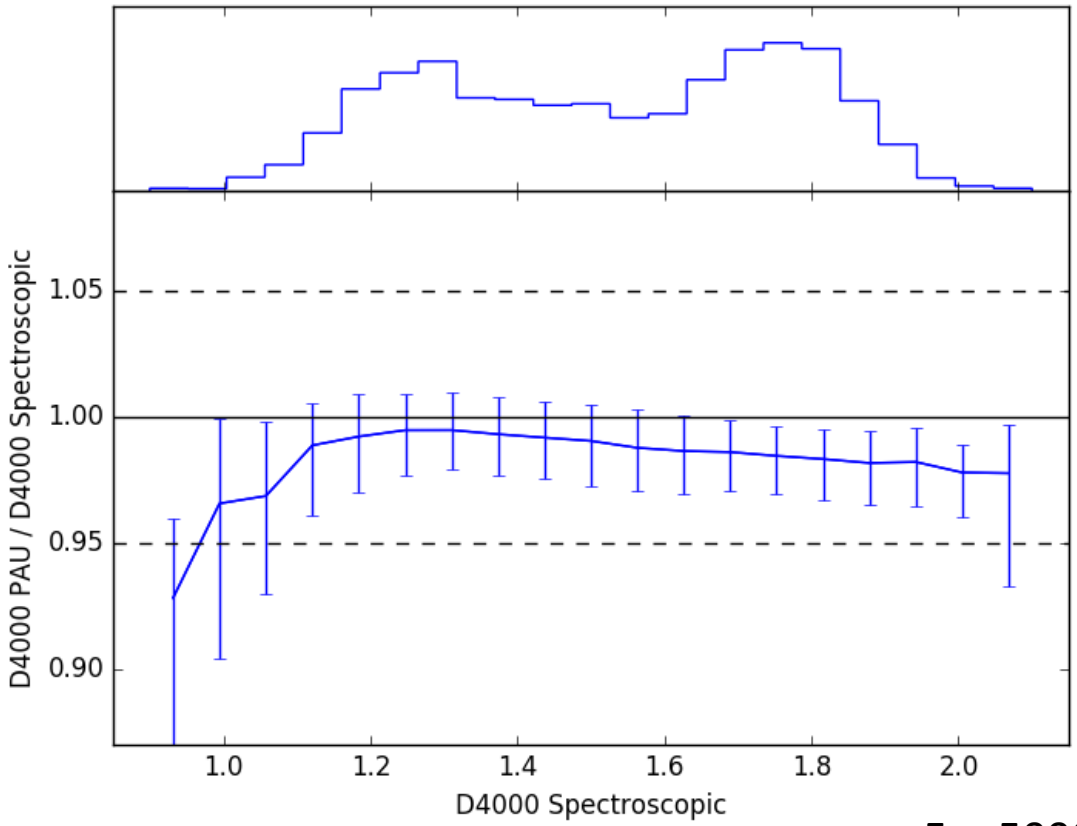
N-Body Sim (Millennium) → Semi-Analytic Model (Galform) → Interpolate to produce lightcone



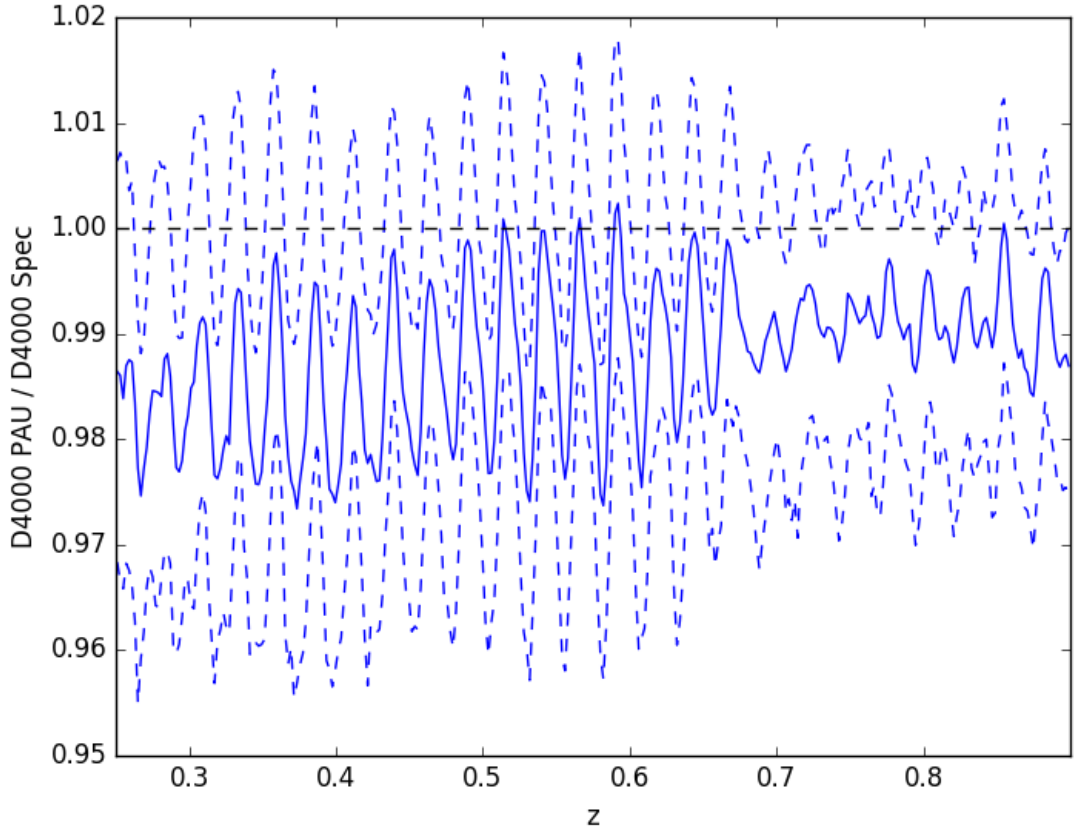


4000Å Break – PAUCam high enough resolution?

Resolution sufficient to measure D4000 to within 3% for most galaxies



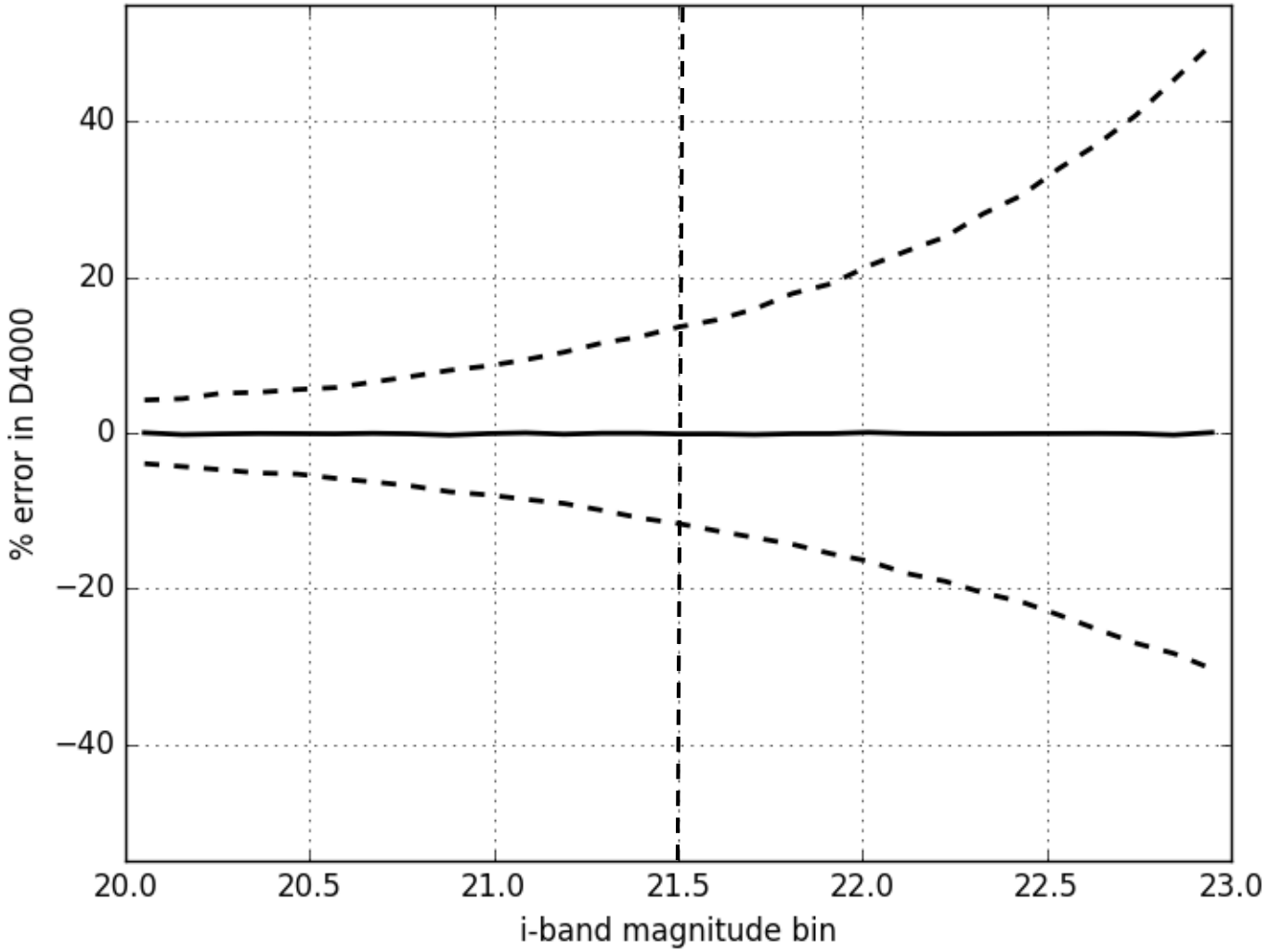
Redshift dependence of measurement up to ~2% due to filter interpolation changing with z



For 5000 SDSS DR12 Spectra

4000Å Break – PAUS Survey potential

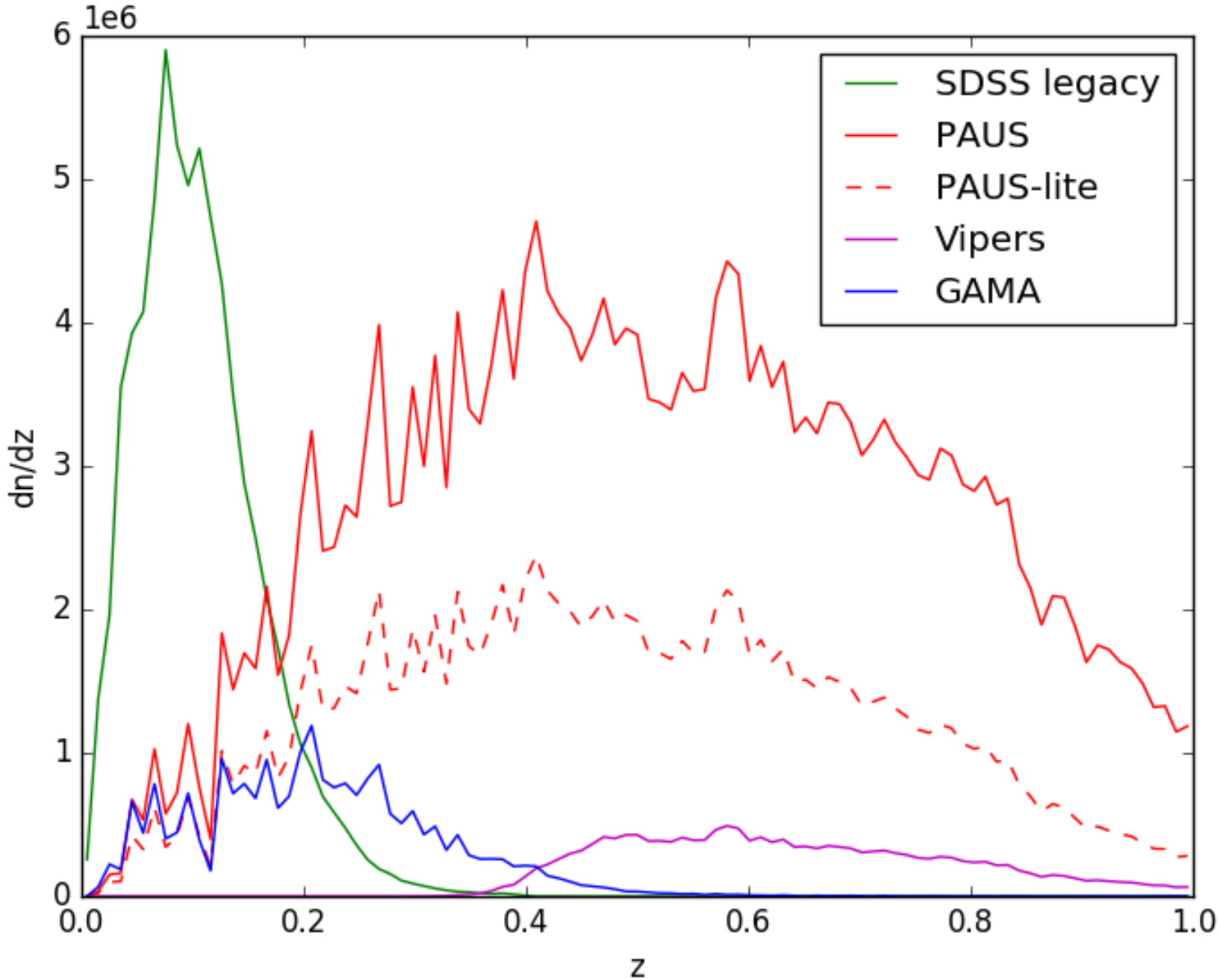
- Measurable for bright subset of PAUS galaxies
- Photometry errors dominate resolution/redshift errors
- +- 10% at i < 21.5



Summary

- PAUS narrow band galaxy redshift survey underway
- 100 sq.deg PAUS will provide ~ 2 million redshifts, $0.1 < z < 1.0$, $i < 23$
- D4000 measurable with PAUCam narrow bands
- D4000 measurable for bright subset of PAU Survey

EXTRA: PAUS also able to identify galaxy emission lines, e.g, Hα changes one filter by 50% flux or more in 50% of cases where visible


1e6
6
5
4
3
2
1
0
dn/dz
0.0
0.2
0.4
0.6
0.8
1.0
z
SDSS legacy
PAUS
PAUS-lite
Vipers
GAMA