

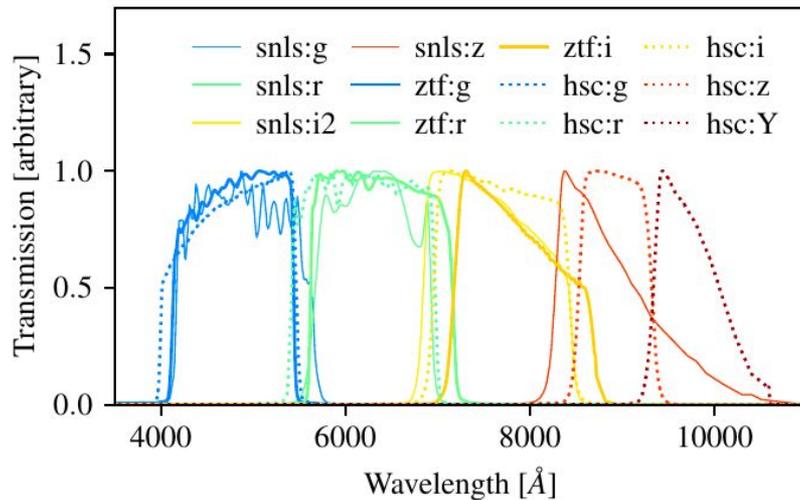
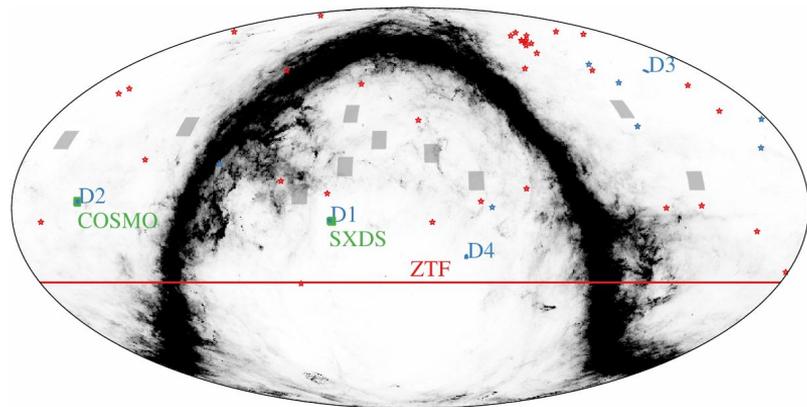
LC calib paper

Maude Le Jeune and co
January 28-30, Clermont

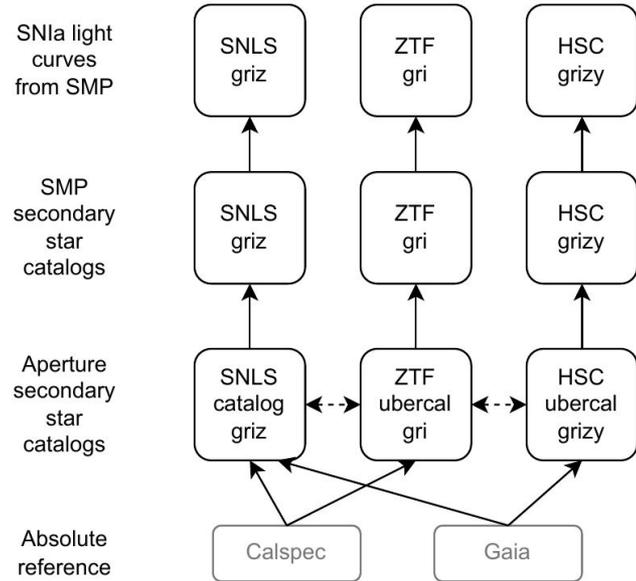
<https://gitlab.in2p3.fr/lemaitre/papers/calib>

Paper outline

1. Overview (data set, methodology)
2. Internal consistency
 - a. Spatial uniformity
 - b. Passbands consistency
 - c. Relative linearity
3. Joint secondary stars AB calibration
4. Light curve calibration
5. External systematics and uncertainties



Status : input readiness



	ubercal	Filters + atm	SMP cats
ZTF	27/10/25	28/11/25 v4	23/12/25 no PE corr
SNLS	24/07/24	24/07/24 no CCD QE	dec 2014
HSC	Last week missing stars	Jan 2024	In prod

Based on:

- ZTF (ubercal, filters, lc release papers)
- SNLS (Betoule in prep)
- HSC (Regnault in prep)

Status : results

2. Internal consistency

- Spatial uniformity : Gaia ↔ ubercal → OK 2 mmag RMS
- Passbands consistency : preliminary results
 - SNLS ↔ ZTF 1K stars in gri
 - HSC ↔ ZTF 3.7K stars in gri
 - SNLS ↔ HSC 866 stars in griz
- Relative linearity
 - SNLS ↔ ZTF 7.7K stars in gri
 - HSC ↔ ZTF 40k? stars in gri
 - SNLS ↔ HSC 5k? stars in griz

HSC: need consolidated secondary star cat
SNLS: update on bandpasses to come

3. Joint secondary stars AB calibration

→ ~OK, ~30 ZTF, 6 SNLS (missing GD71), few mmag RMS in all bands

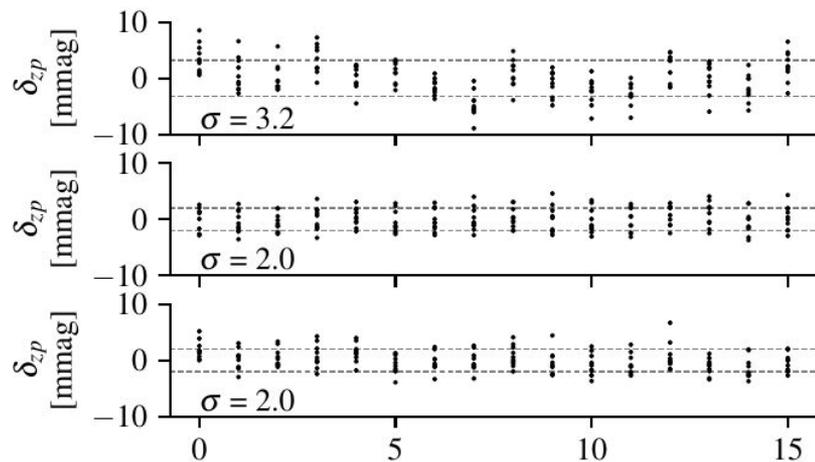
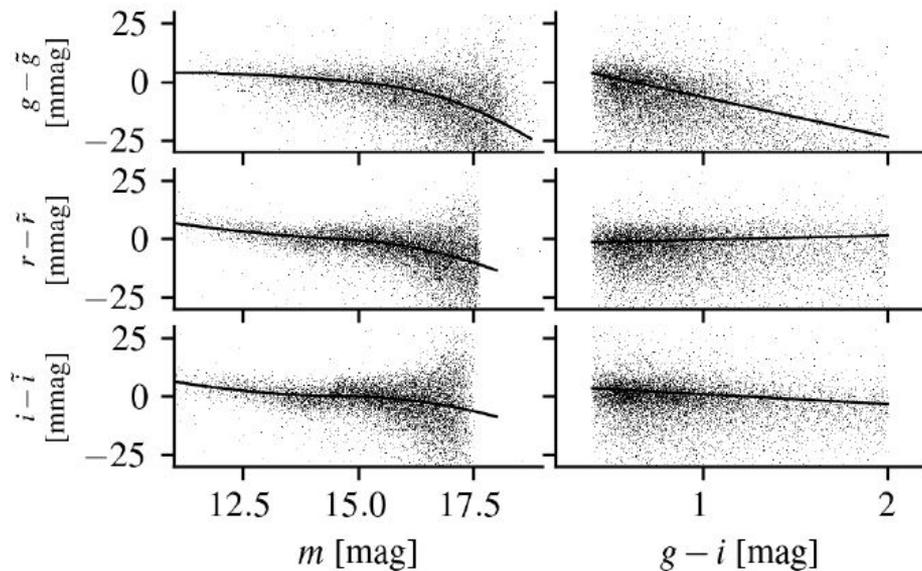
4. Light curve calibration

- missing HSC LC
- missing ZTF with PE correction
- need to harmonize SNLS background correction
- need to release PSF effective filters for the 3 surveys

5. External systematics and uncertainties → TODO

Internal consistency: 1. spatial ubercal uniformity

- gaia synthetic - ubercal on 10 patches of 50 sq deg (500-1000 stars / cdd / patch)
- correct gaia synthetic from fnl and color on the stack

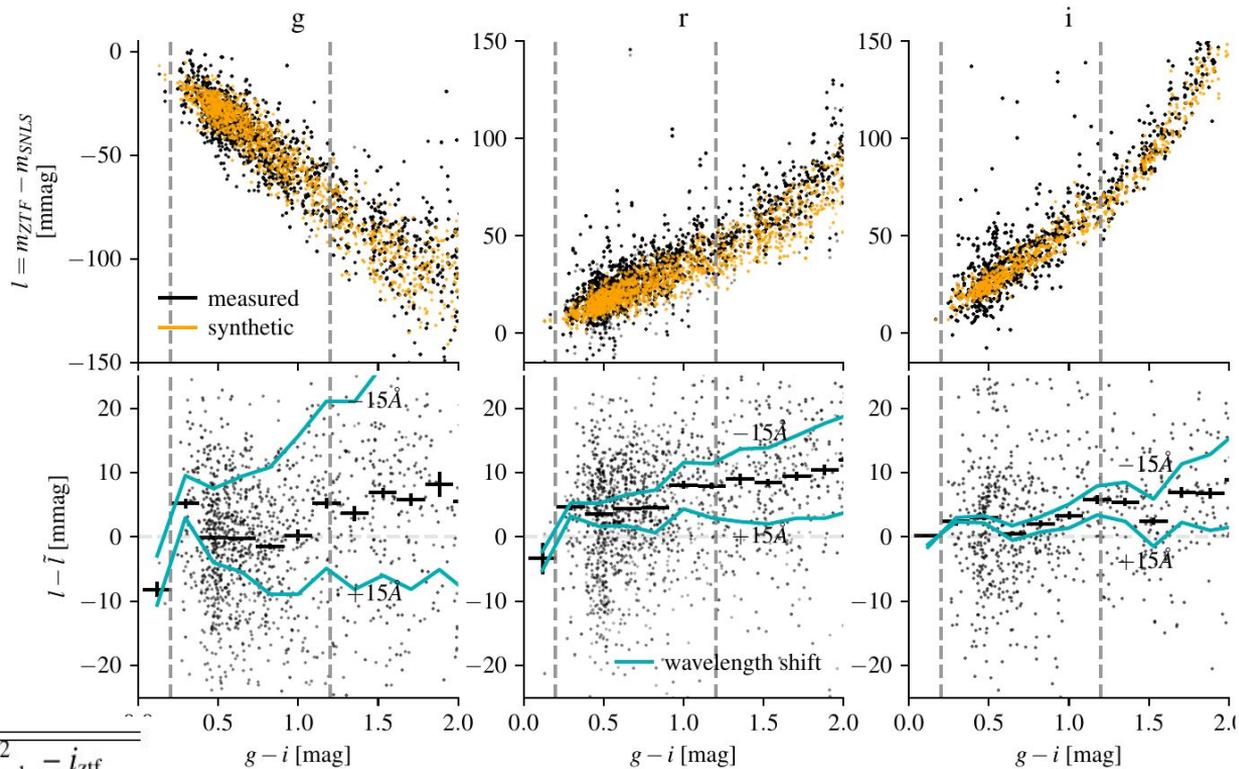


Internal consistency: 2. Passbands consistency

1. ZTF - SNLS:

7700 stars in common

1100 with Gaia Xp



	$g_{snls} - g_{ztf}$	$r_{snls} - r_{ztf}$	$i_{snls}^2 - i_{ztf}$
measured	59.2 ± 0.8	-39.8 ± 0.8	-56.7 ± 0.9
synthetic	59.5 ± 0.5	-32.7 ± 0.4	-51.5 ± 0.4
systematic error	± 4	± 2	± 4

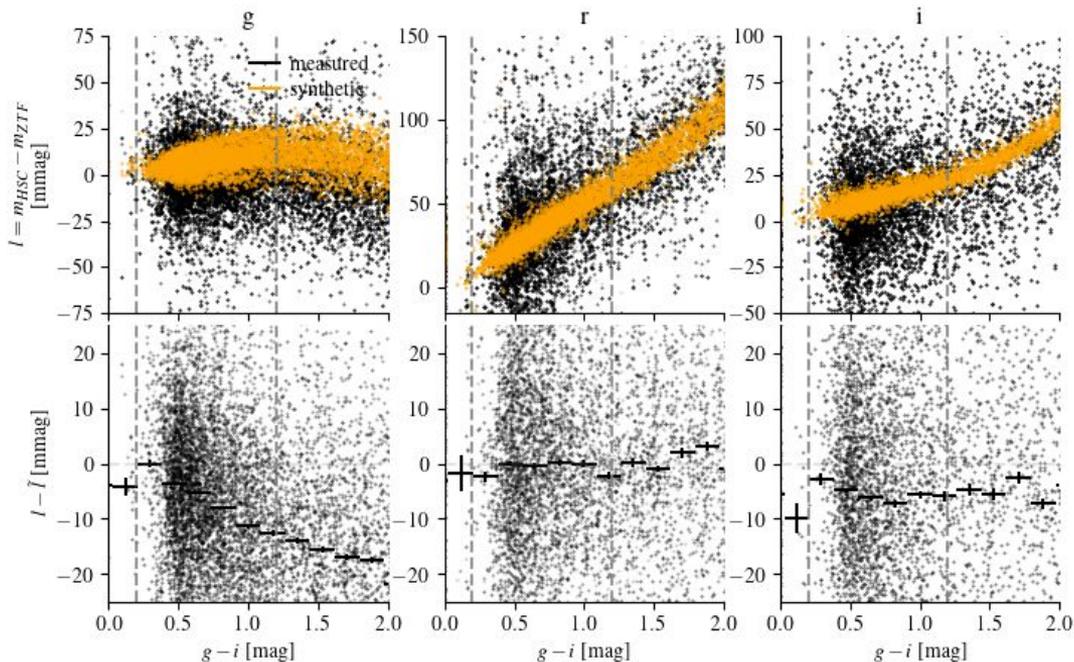
Internal consistency: 2. Passbands consistency

Preliminary !

2. ZTF - HSC: (preliminary)

3710 stars in common
with Gaia Xp

	g-g	r-r	i-i
meas	2.9	48.9	8.2
syn	10.7	47.4	17.



Internal consistency: 2. Passbands consistency

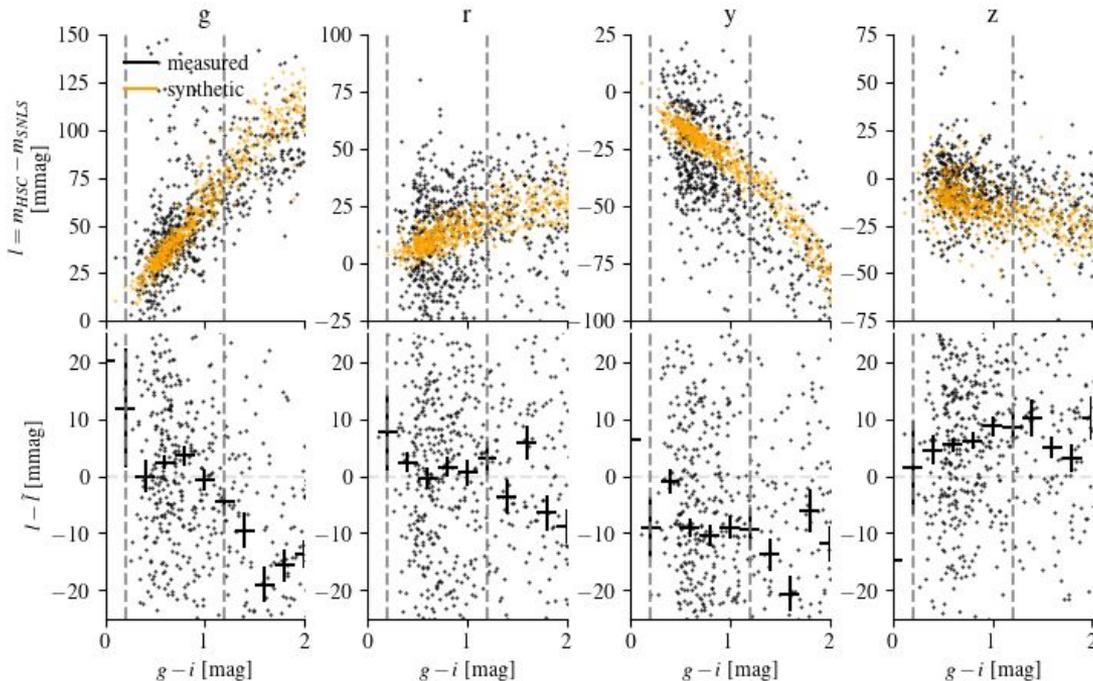
Preliminary !

3. SNLS - HSC:

866 stars in common

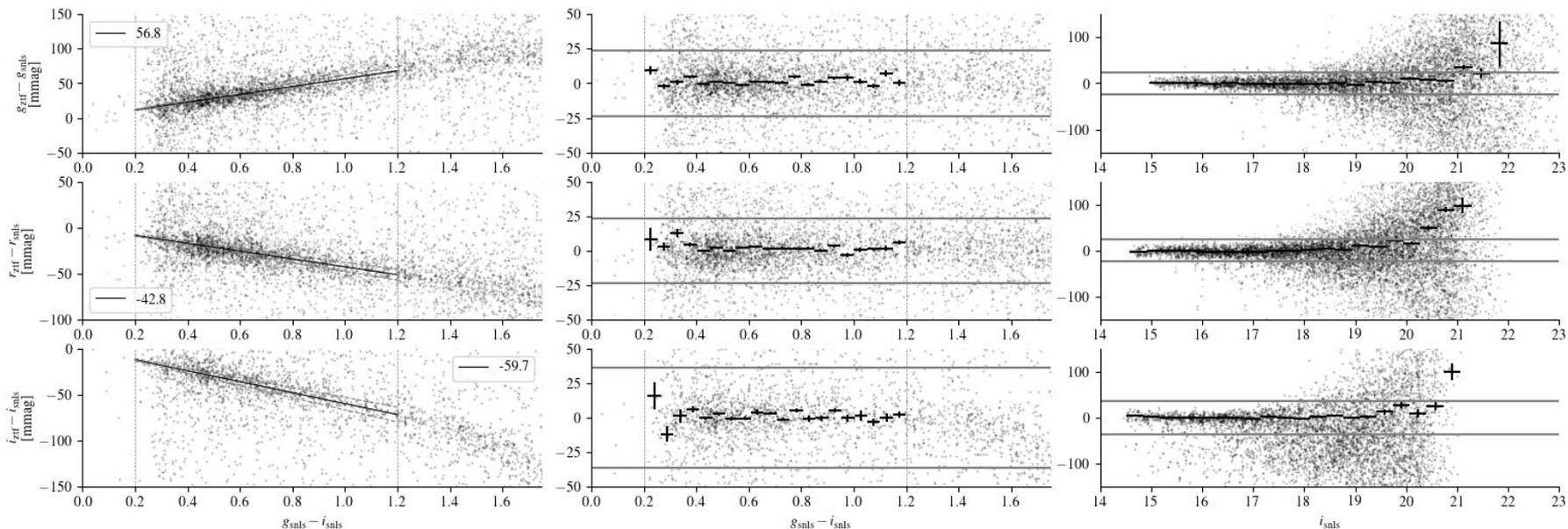
with Gaia Xp

	g-g	r-r	i-i	z-z
meas	62.2	16	-39.3	-8.1
syn	60.8	16.8	-30.1	-16.5



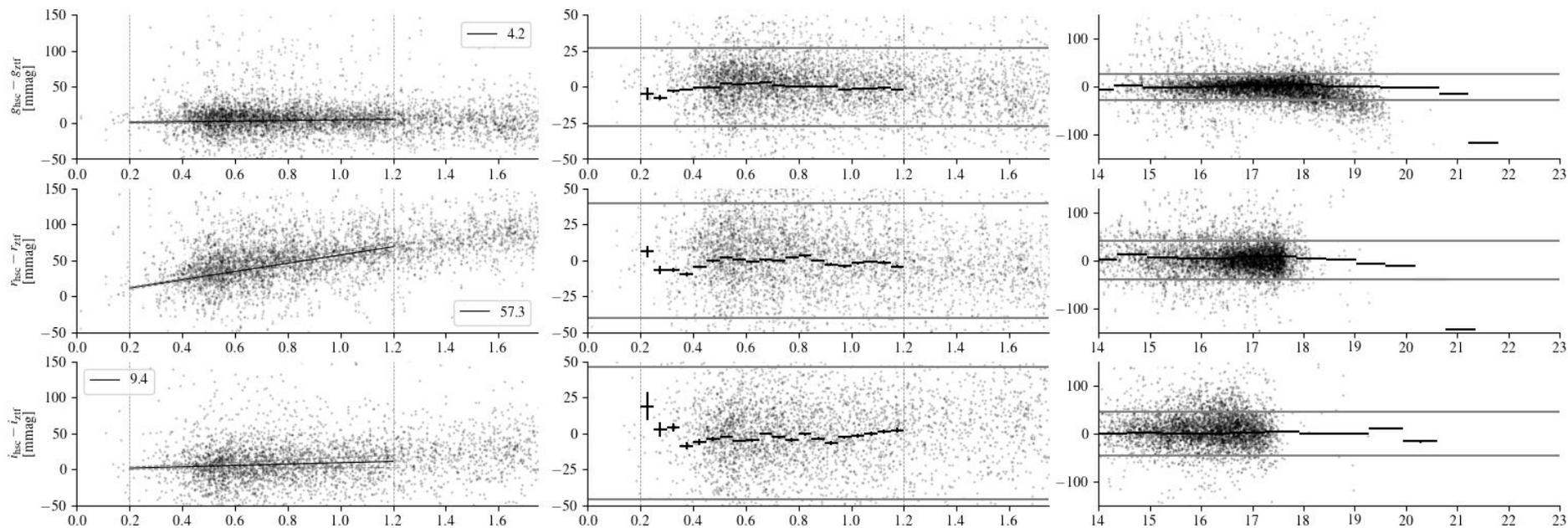
Internal consistency: 3. Relative linearity

1. ZTF - SNLS



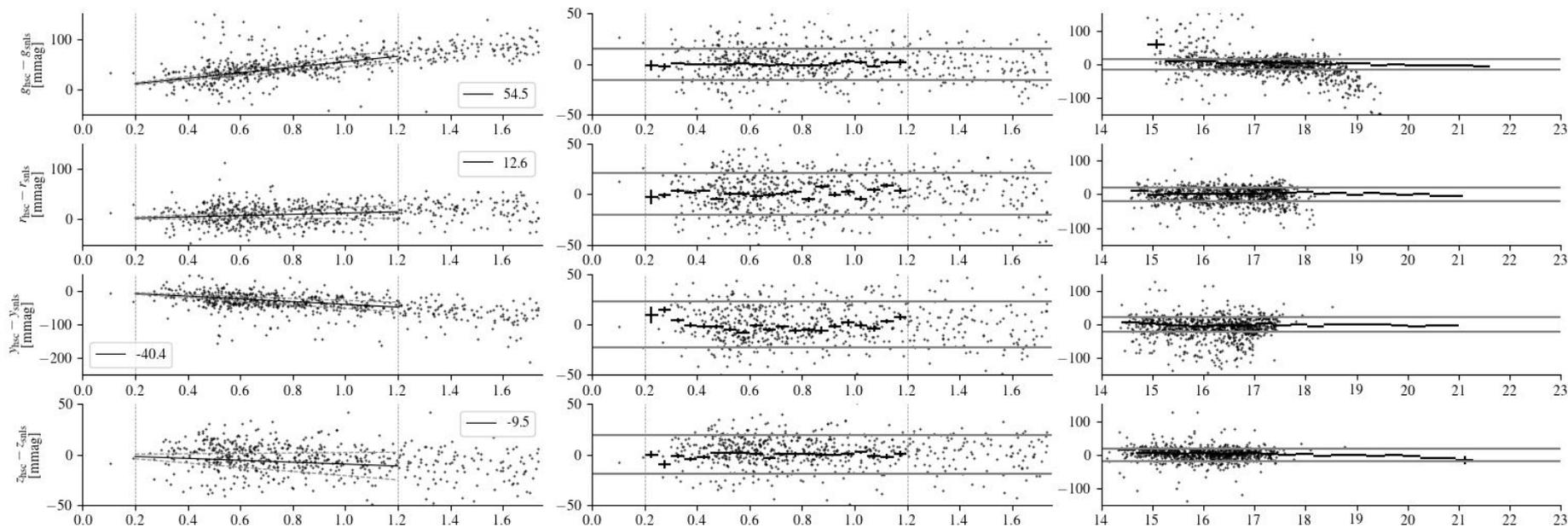
Internal consistency: 3. Relative linearity

2. HSC - ZTF (preliminary, to be completed with faint stars)



Internal consistency: 3. Relative linearity

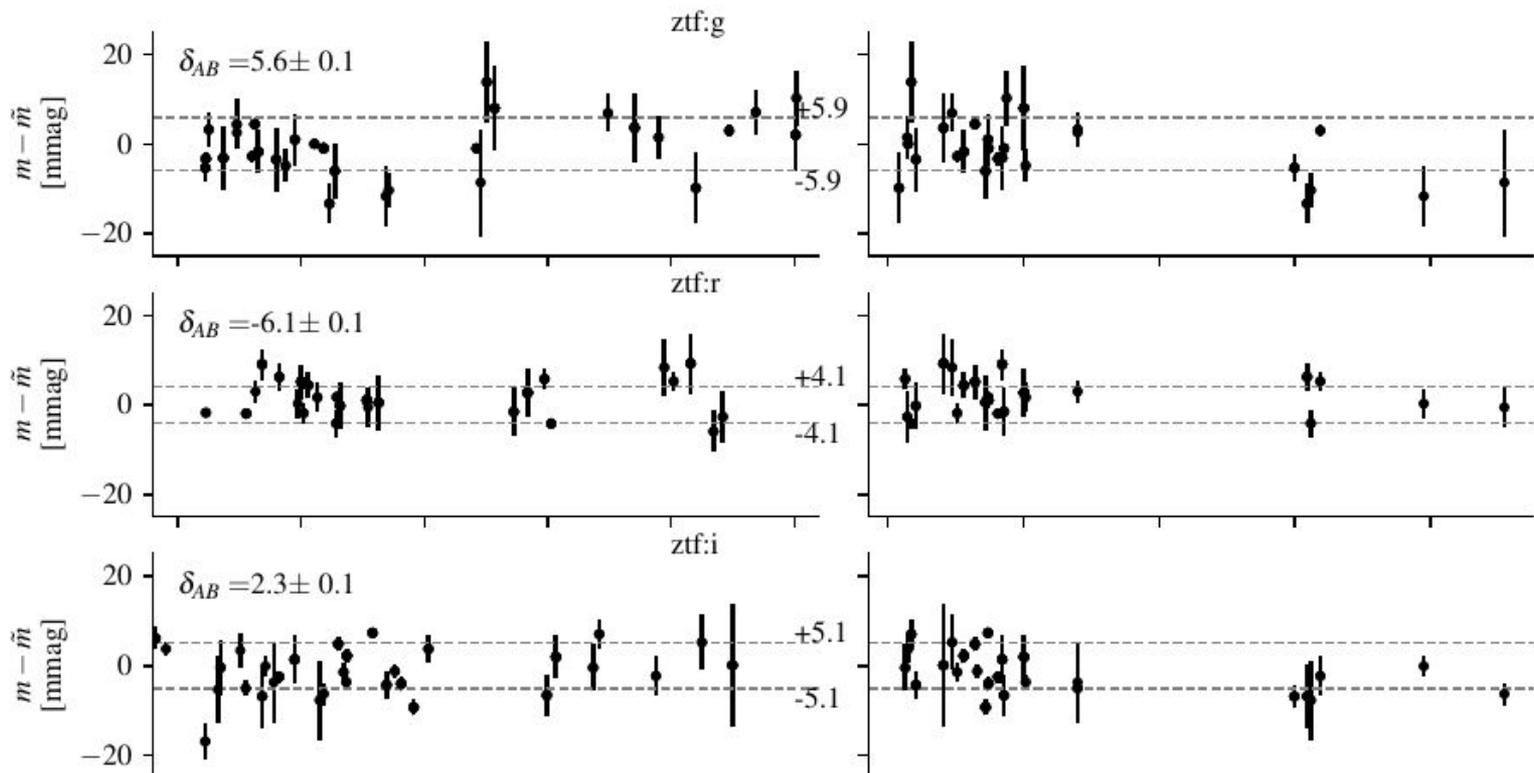
3. HSC - SNLS : **preliminary, to be completed with faint stars**)



Joint secondary stars AB calibration

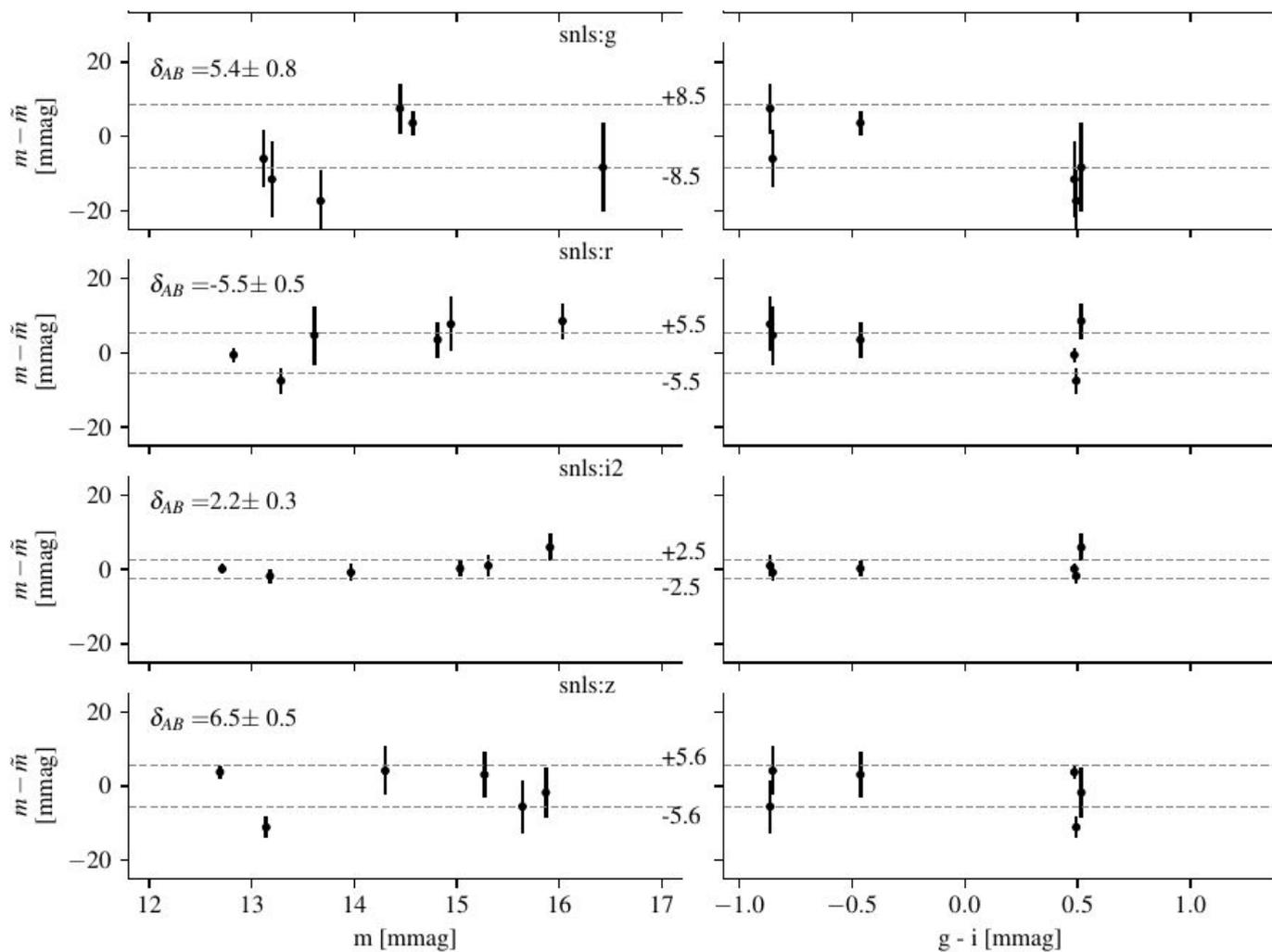
~30
calspec

Need to
refine the
error
bars



Missing GD71
Need to refine
the error bars

need to xcheck
spectra above
1000A



LC calibration

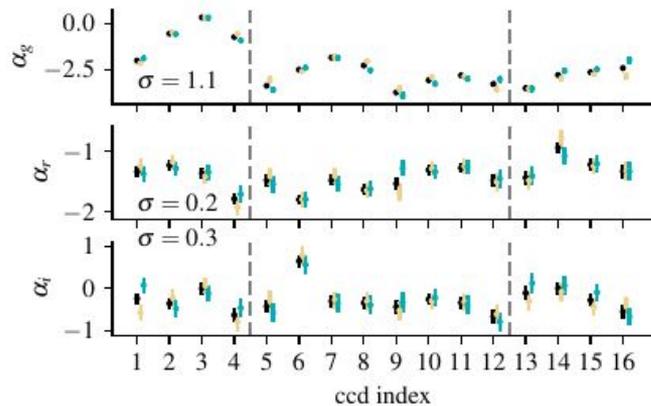
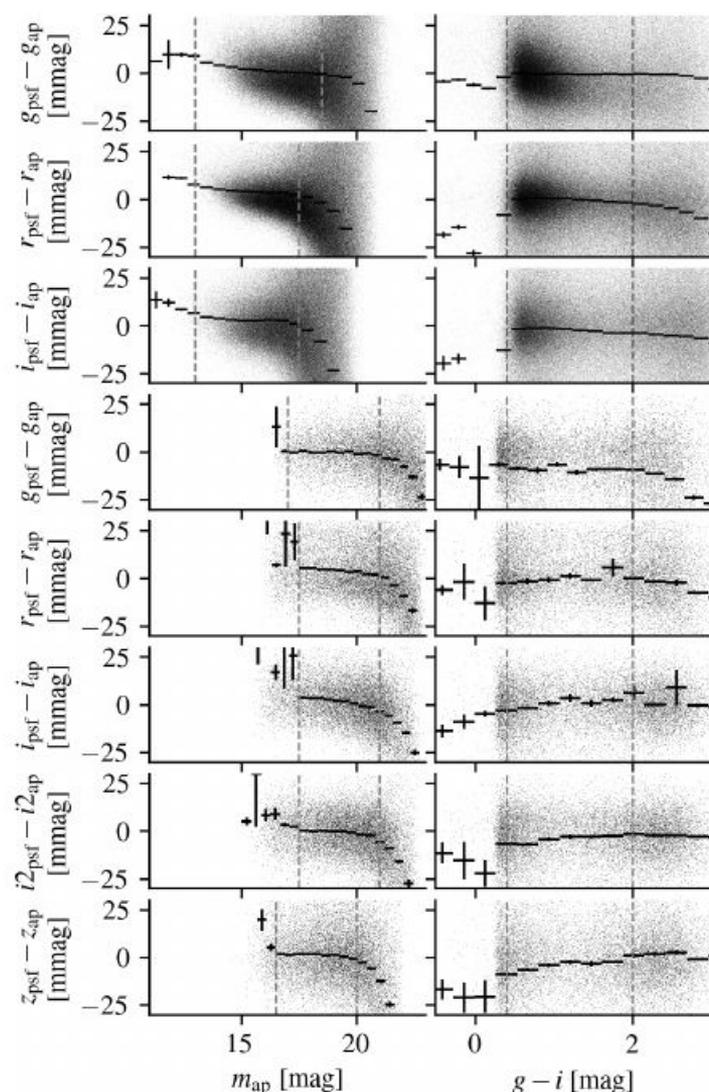


Table 6: RMS of the color terms across the 16 CCD (ZTF) and the 4 fields (SNLS), in mmag/mag

Band	RMS of the color term	Predicted error
g_{ztf}	0.8	0.3
r_{ztf}	0.4	0.2
i_{ztf}	0.4	0.4
g_{snls}	2.0	0.2
r_{snls}	0.2	0.2
i_{snls}	0.4	0.2
i_{snls}^2	0.3	0.2
z_{snls}	0.4	0.2



Status: text

1. Overview (data set, methodology)

→ dataset introduction done, missing paper introduction

2. Internal consistency

a. Spatial uniformity → ~OK

b. Passbands consistency → TODO after consolidated results on HSC/SNLS

c. Relative linearity → TODO after consolidated results on HSC/SNLS

3. Joint secondary stars AB calibration → To be completed

4. Light curve calibration → To be completed

5. External systematics and uncertainties → To do

6. Conclusion → missing

To discuss

- UBERCAL data cuts: (table 1 and 2), proxy for saturation, and for contamination (flag is too conservative, can we have a “flux from others” ?)
- Cross check CALSPEC table (+ bbf details) with the ones used in the camera paper
- Plot cosmology + discussion
- Paper release and follow-up
 - Pets replacement : who can gather environmental data for the 3 surveys ?
 - Blinding / unblinding : need a well defined plan to get ready wrt storage, environment and tools
 - Paper blinded release includes:
 - blinded LC through BNB
 - PSF bandpasses through BBF
 - Unblinded release: need a list of milestones before unblinding, and a rough timeline

Backup slides

Blinding : status today

- Access to uncalibrated LCs
 - SNLS@ccin2p3 : everyone in the snls group
 - HSC@ccin2p3 : everyone in the ztf group
 - ZTF@ccin2p3 : everyone in the ztf group
- Access to calibrated LCs + calibration pipeline
 - git = lemaitre-data = Maude, Mathieu, Thomas, Jeremy
 - env + data @ ccin2p3 : Maude
- Access to blinding function: Mathieu only
- Access to blinded data: everyone (web)