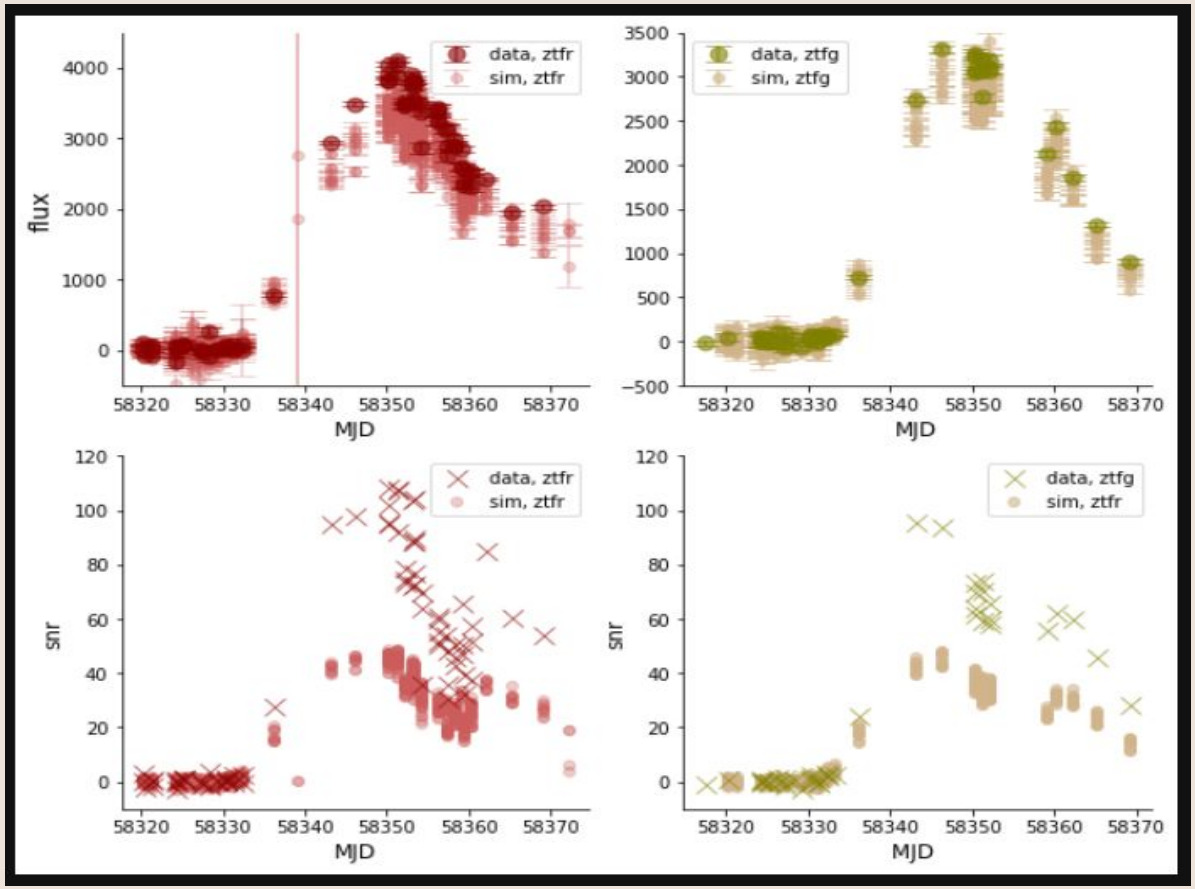
Replicating ZTF DR2 : where do we stand ?

ZTF France meeting

March, 21st 2022, Clermont-Ferrand

Mélissa (speaker), Philippe and Mat

What is wrong



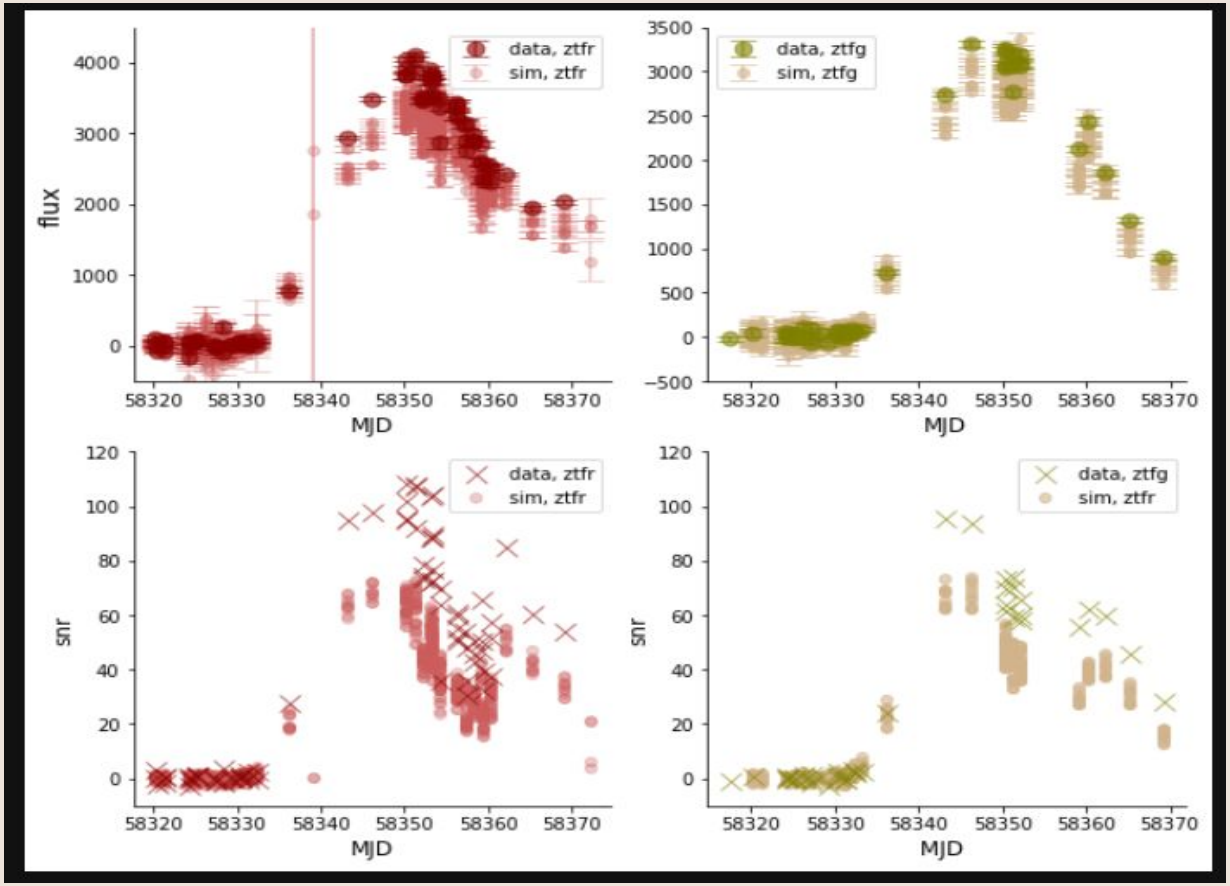
skynoise: from difference image magnitude limit

Gain : 1

$$\sigma_{flux} = \sqrt{skynoise^2 + |flux/gain|}$$

$$\frac{10^{0.4\times(zp-mag_{lim})}}{5}$$

Key ingredients



<u>skynoise:</u> from difference image magnitude limit

<u>Gain</u> : 6

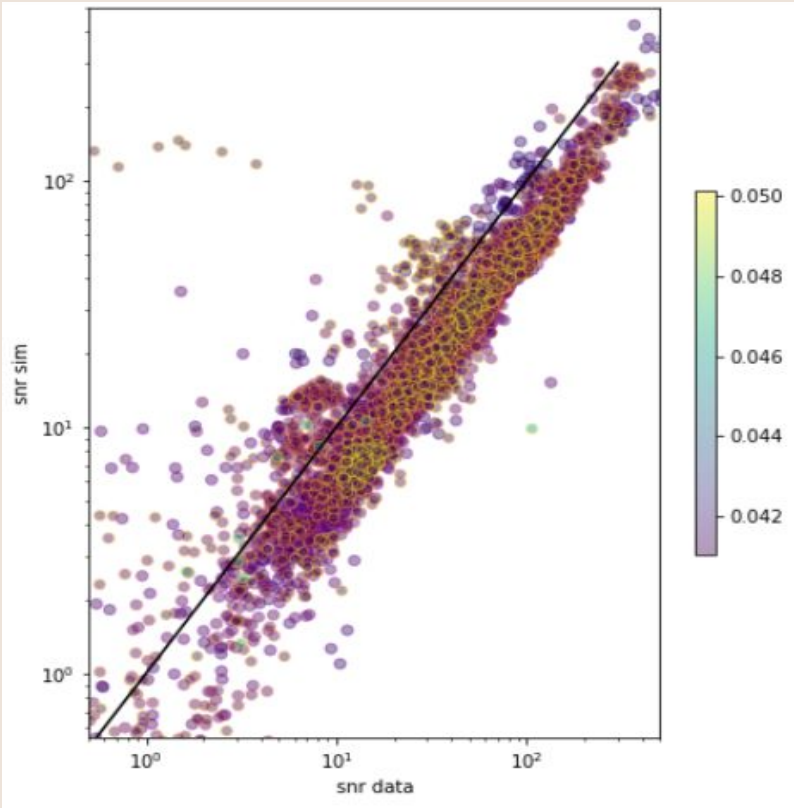
$$\sigma_{flux} = \sqrt{skynoise^2 + |flux/gain|}$$

$$\frac{10^{0.4 \times (zp - mag_{lim})}}{5}$$

Diff image magnitude limit, gain = 6

half 2019

ztfr



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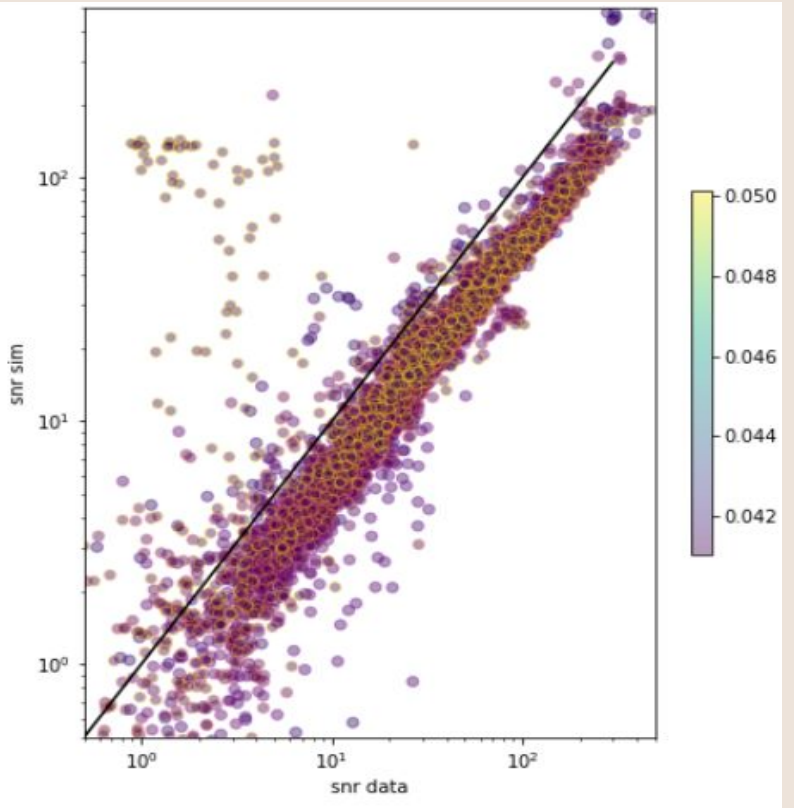

Errors comparison

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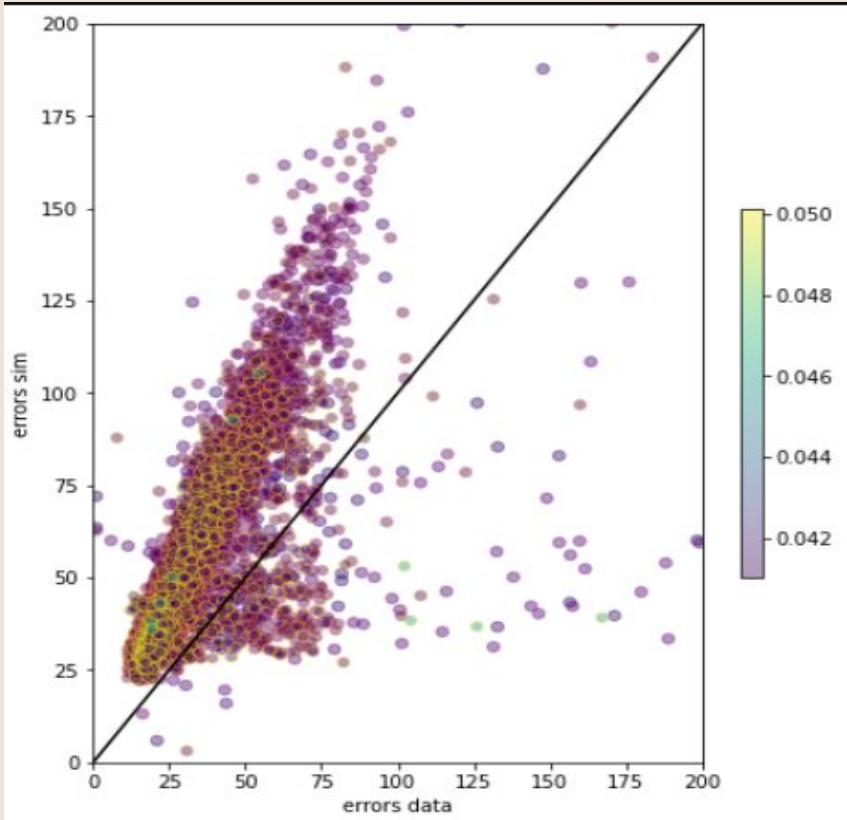

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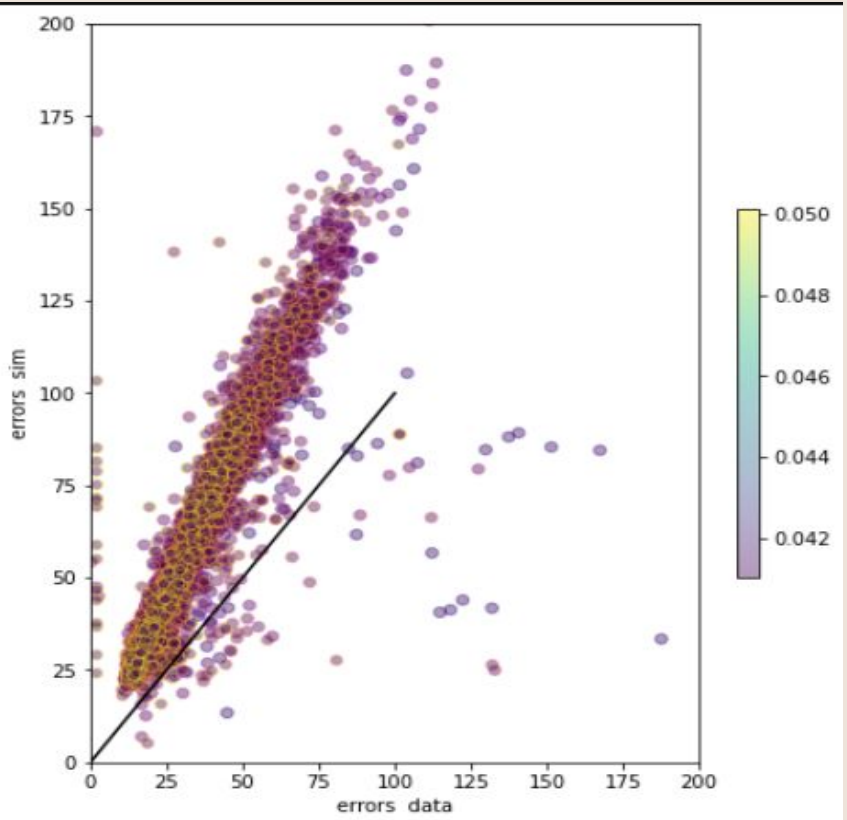

SCI image magnitude limit , gain = 6

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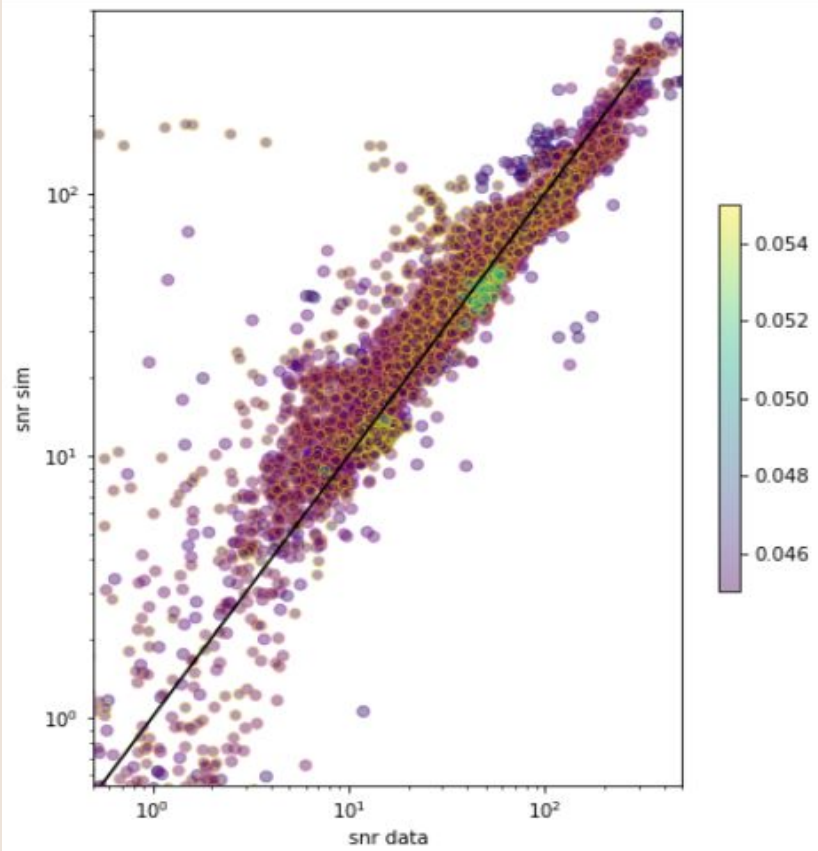

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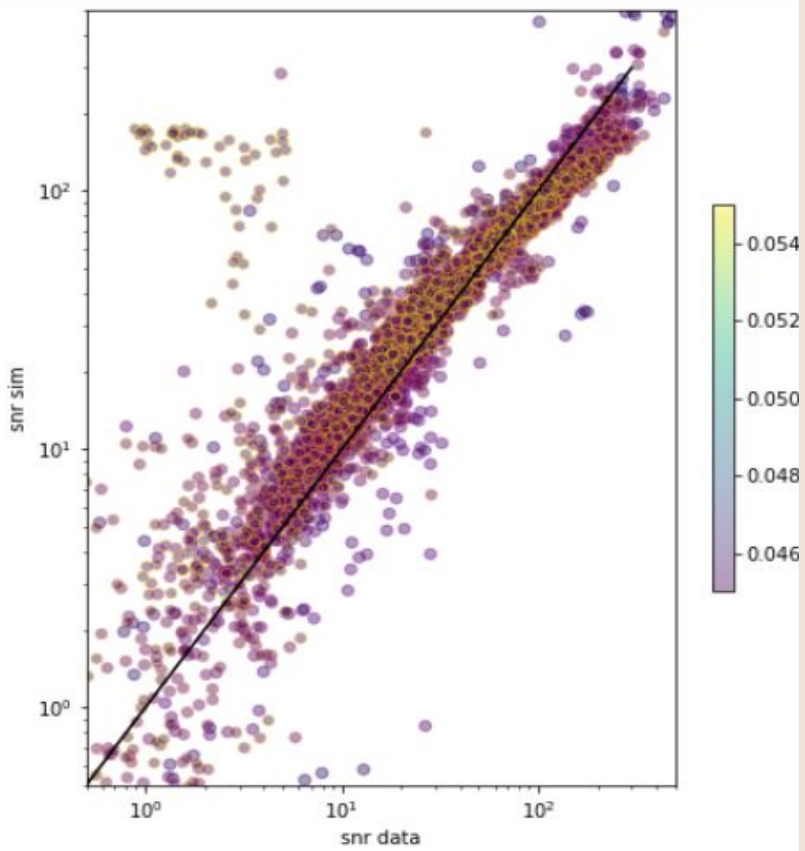
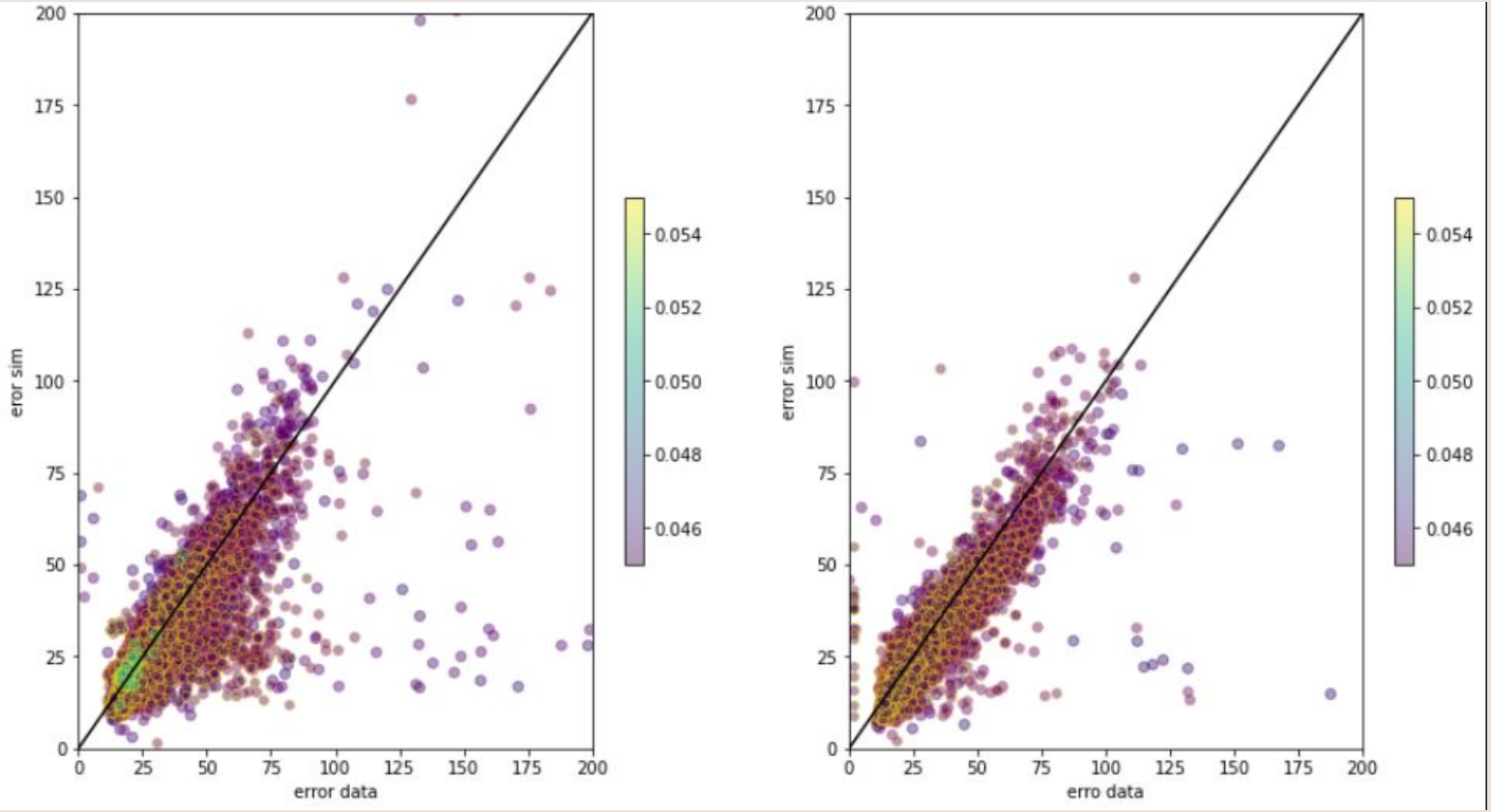
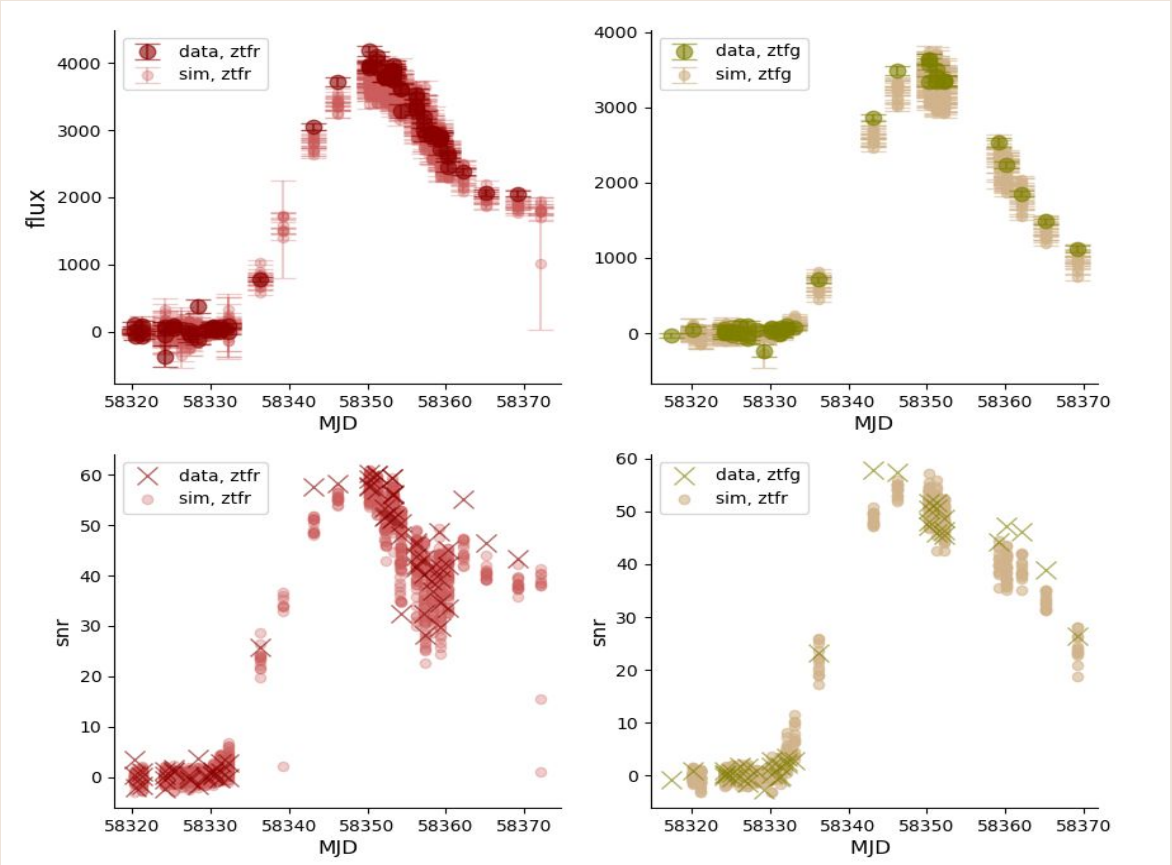


The errors


eror sim
error data
0
25
50
75
100
125
150
175
200
0.054
0.052
0.050
0.048
0.046
error sim
erro data

Light-curves with science magnitude limit



skynoise: from science image magnitude limit

Gain : 6

$$\sigma_{flux} = \sqrt{skynoise^2 + |flux/gain|}$$

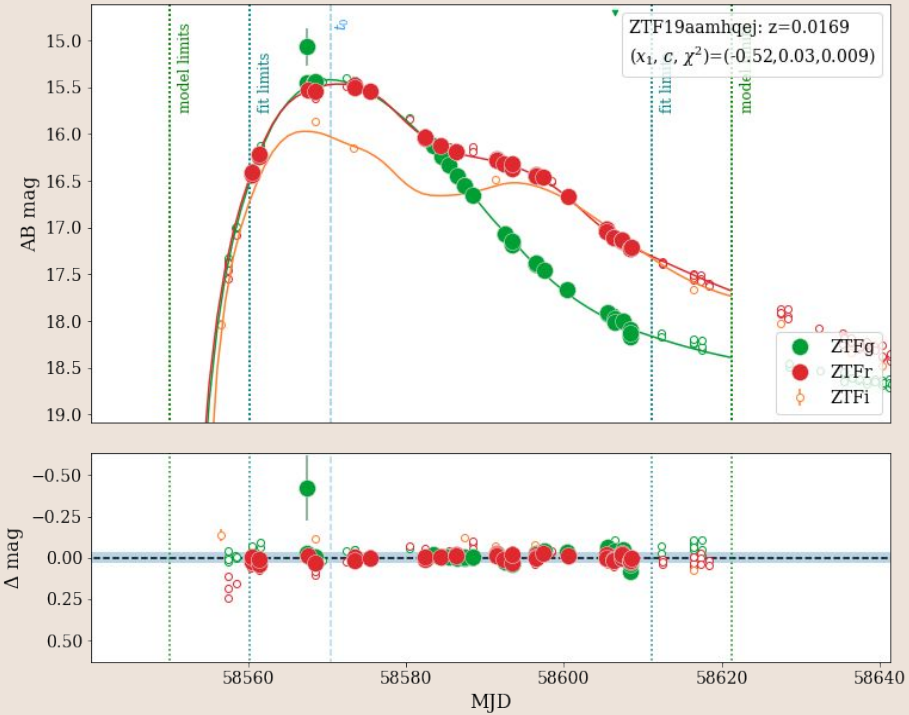
Key message to simulate DR2

It is relative to the data

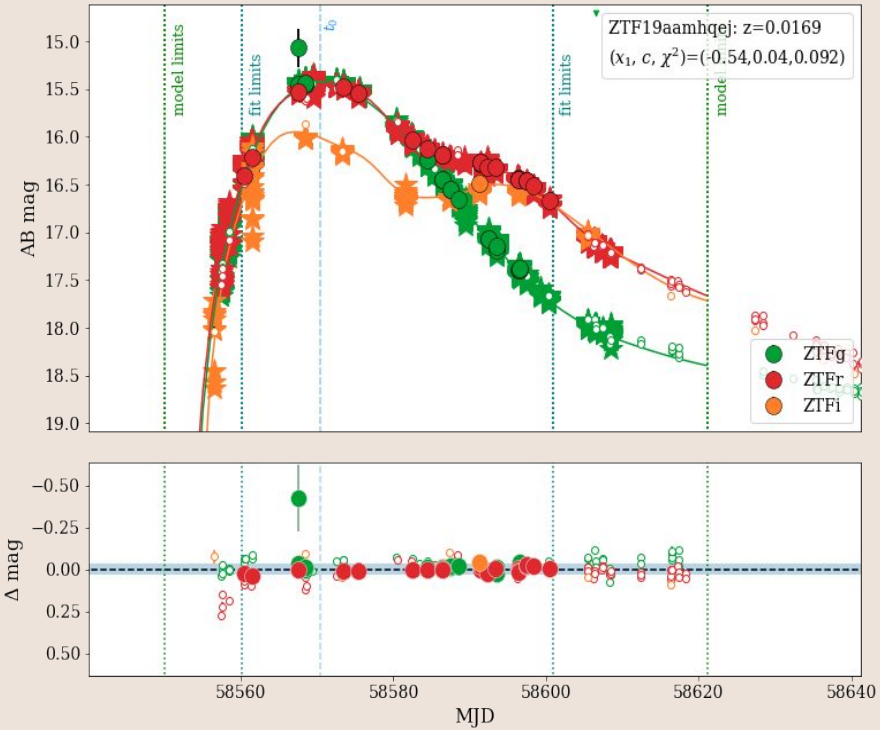
The framework is ready to choose the best config and simulate ZTF data

What are we missing in the simulations

DR2 fluxes compared to the sncosmo model

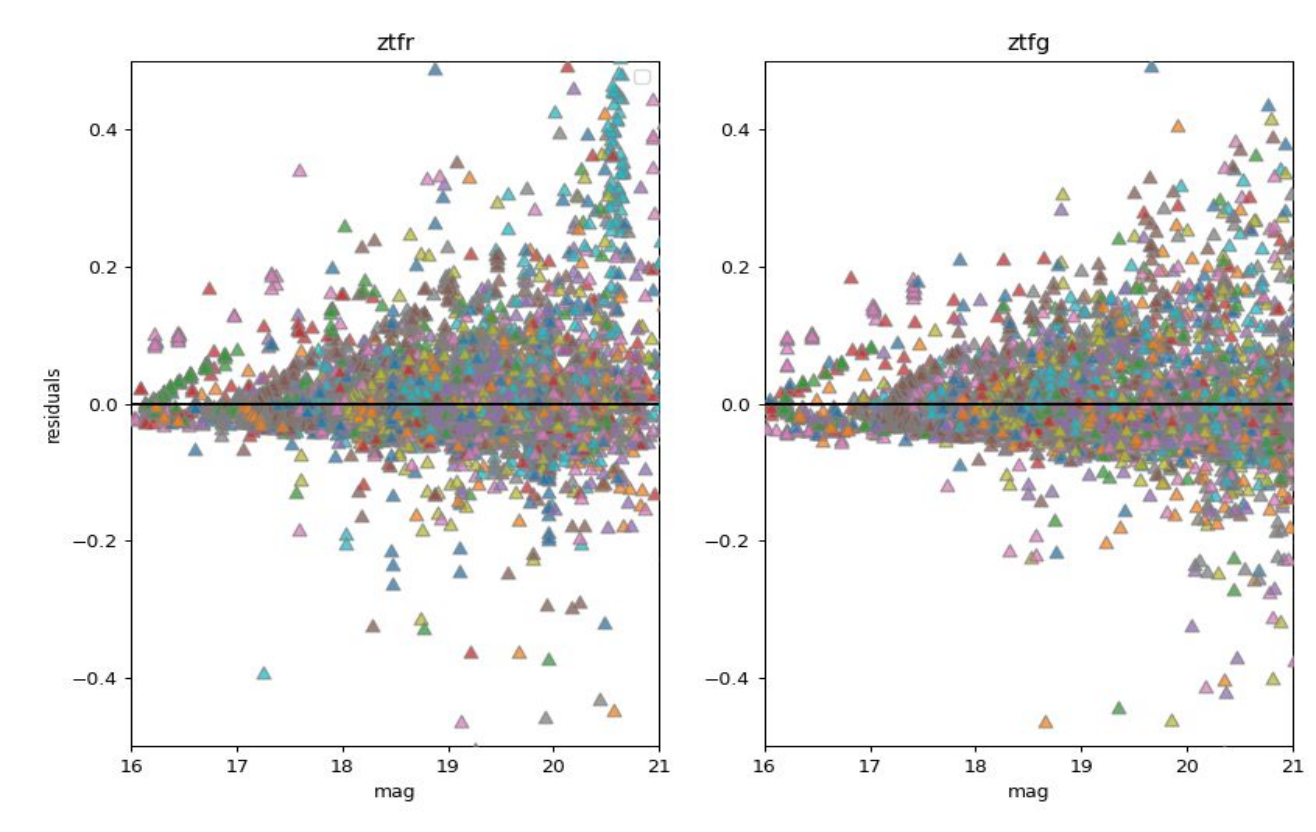


simsurvey fluxes compared to the sncosmo model



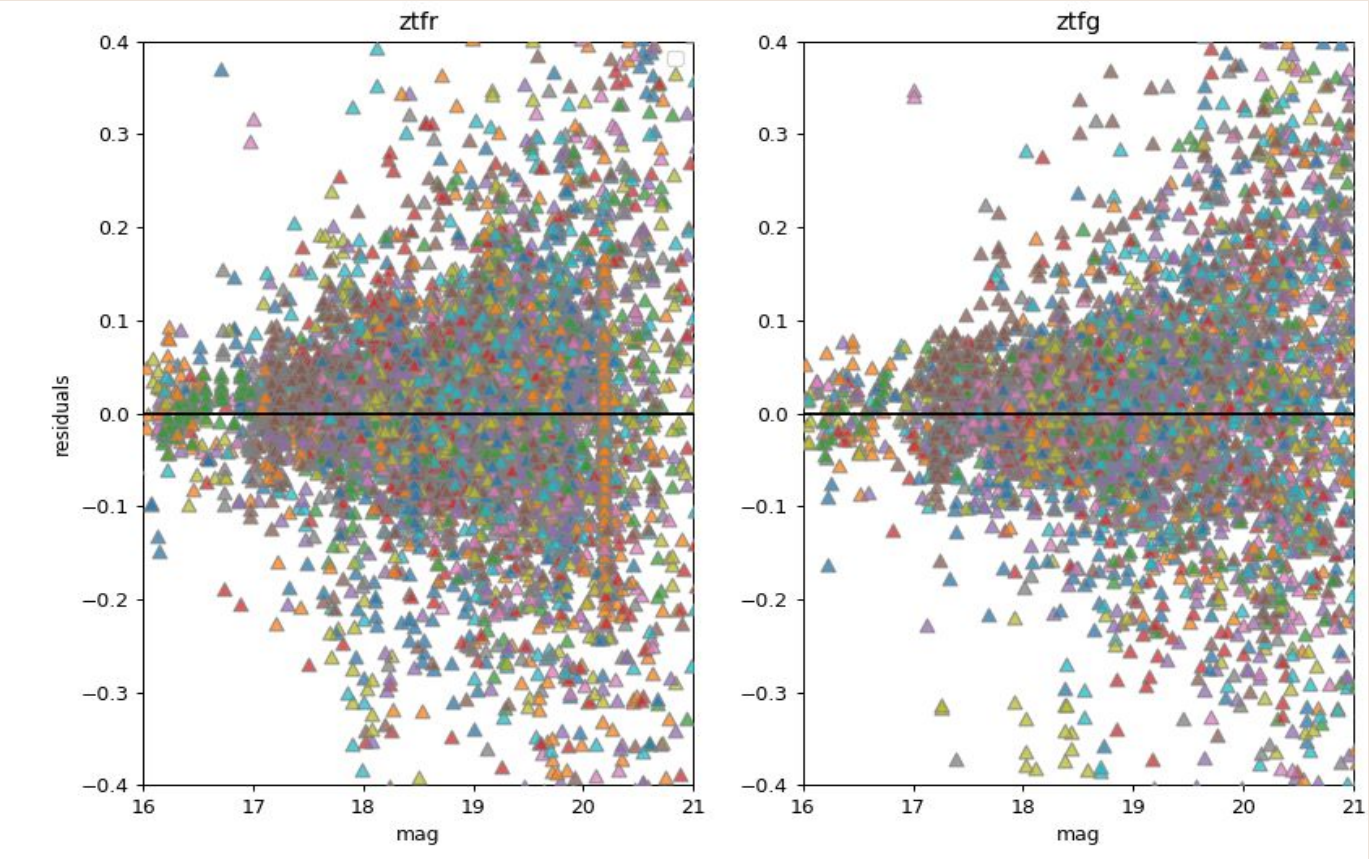
from M. smith

Simulations scatter



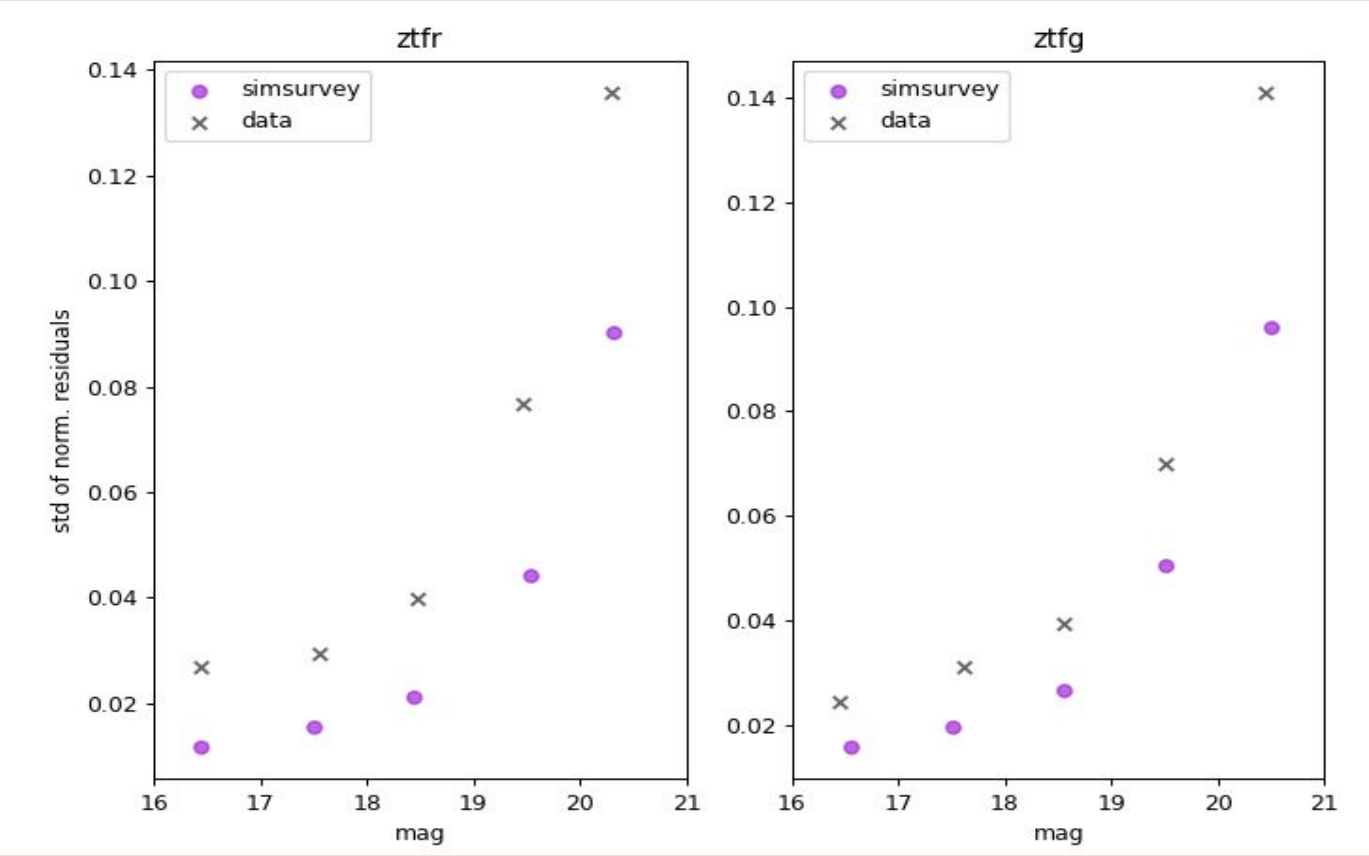
normalized residuals
(sim - model)/model

DR2 scatter



normalized residuals
(dr2 - model)/model

What is missing ?



dispersion of the residuals

Conclusion

… We are almost there

- Preparing for the simulations to match DR2
- Framework ready… Tests in progress
- Efforts focused on trying to replicate completely the data : flux and uncertainties

Flux comparison

half 2019

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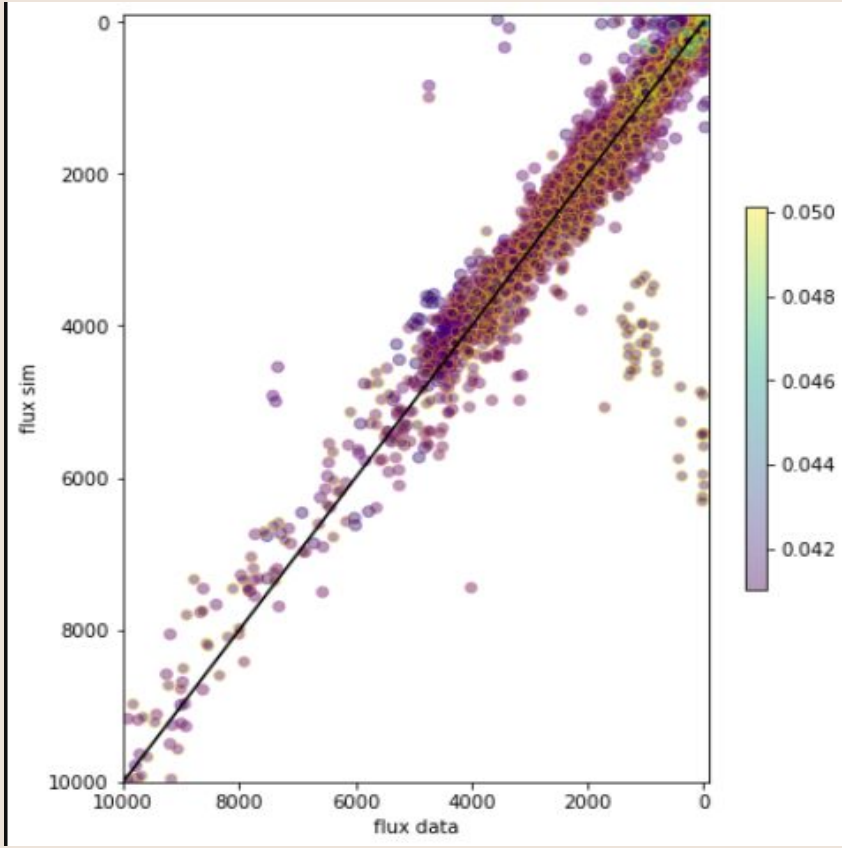

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