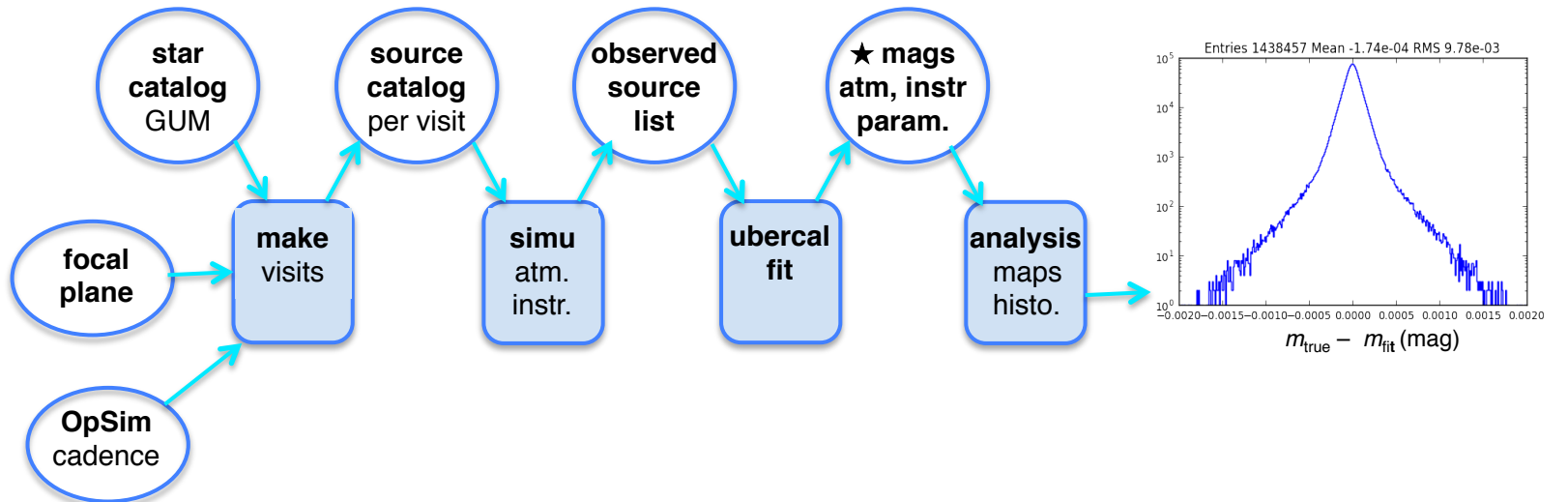
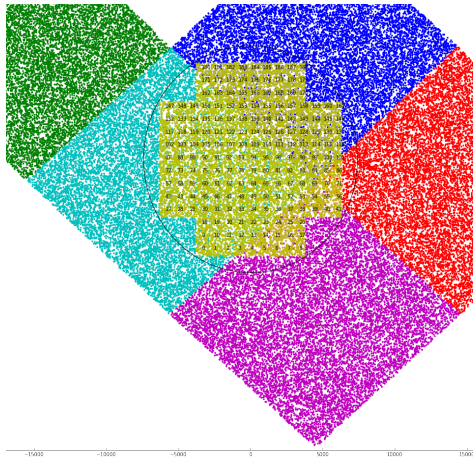


Milli-mag calibration of LSST for cosmology

F. Feinstein⁺, D. Fouchez⁺⁺, J. Cohen-Tanugi[']

⁺ CPPM, U. Montpellier/CNRS-IN2P3 ⁺⁺ CPPM, Aix-Marseille U./CNRS-IN2P3 ['] LUPM, U. Montpellier/CNRS-IN2P3

A software to simulate LSST visits:
star distribution, atmosphere
and instrumental throughput

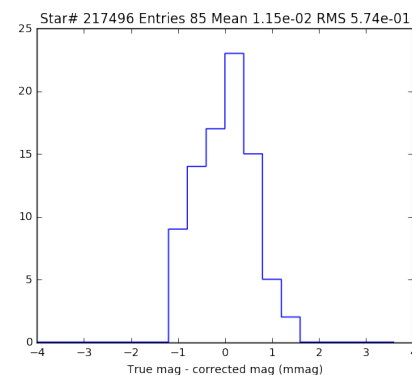
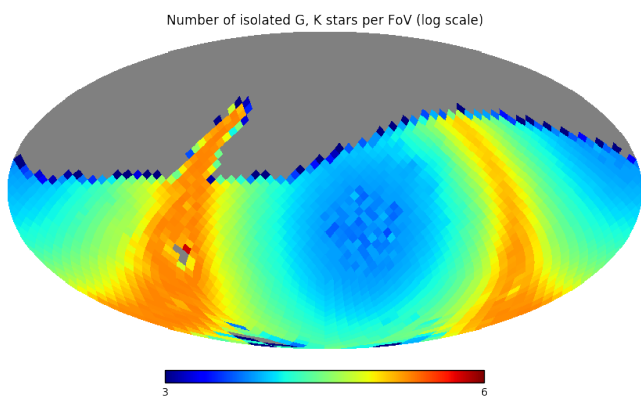


make visits
Projects the camera focal plane on the sky.
Produces a small catalog of observed stars per visit
minion / alt_sched cadences

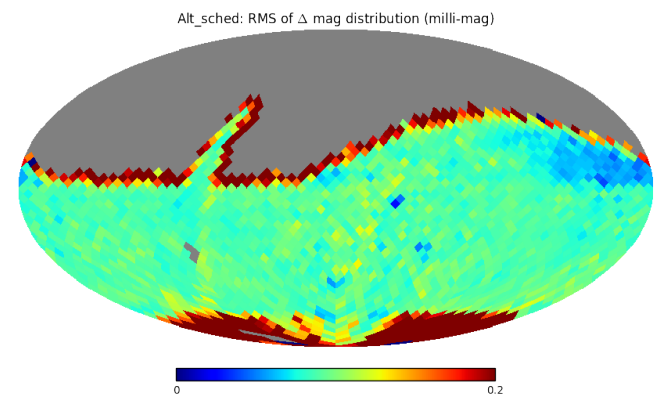
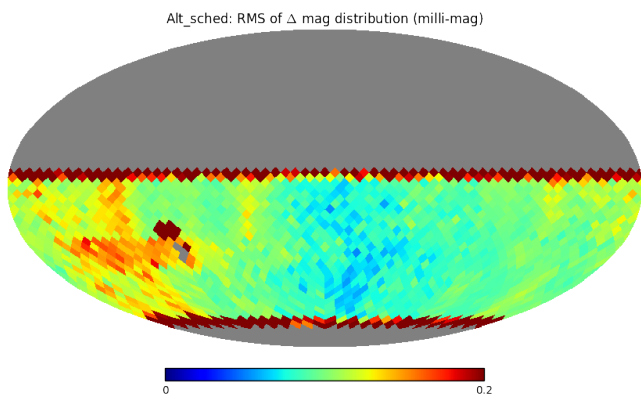
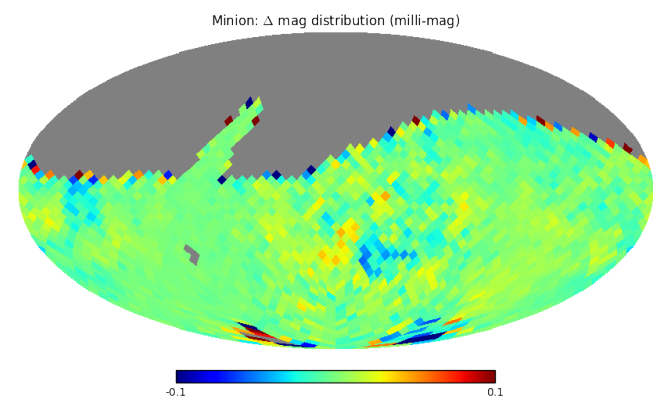
simu atm. instr.
 $m_{\star} = m_{ToA} + kx + Zp_{CCD} + Zp_{visit} + a_{Period}$
CCD Zp change every month
2 periods in a year (mirror cleaning)

ubercal fit
Fit all mags and environm. param.
Huge sparse matrix:
1 year, 55 k visits & 1.4 M ★
28 M sources x 1.5 M parameters
~ 30 min. on HPC (1.5 TB RAM)

analysis maps histo.
Compare fit and true param
Produces histos, plots, maps



Corrected star magnitude, using fitted parameters values



Next steps and questions

$$f_s(filt, v, p) = f_{ToA} \cdot \exp\left(\int [-k(\lambda, t) SED_s(\lambda) Tr(filt) d\lambda] \cdot K_{filter}(t) \cdot x(v)\right) \cdot Gr(v, g) \cdot Instr(p, g)$$

- inject some colour effect : $k(\lambda)$
- inject GAIA star SED information
- inject Aux Tel information
- inject noise : outliers, GAIA errors, Aux Tel errors, ...
- try calibrating DR2 ?
- *HELP/COLLABORATION MOST WELCOME !*