

“Instrument Measurements”

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LSST/DESC Calibration Workshop
5 October, 2018

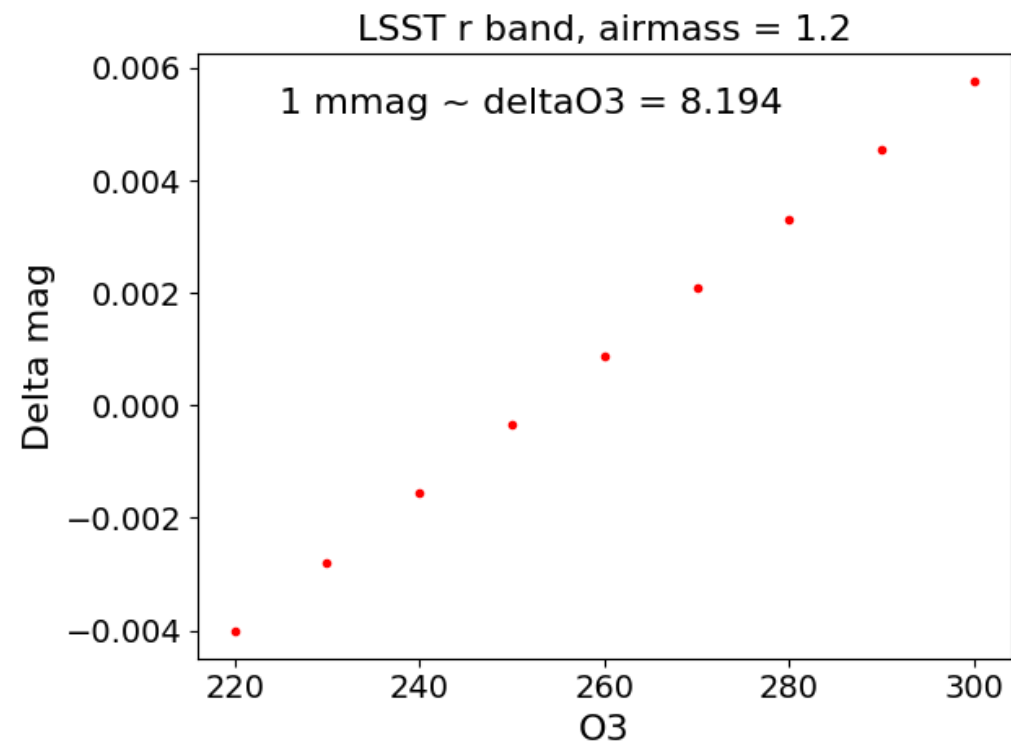
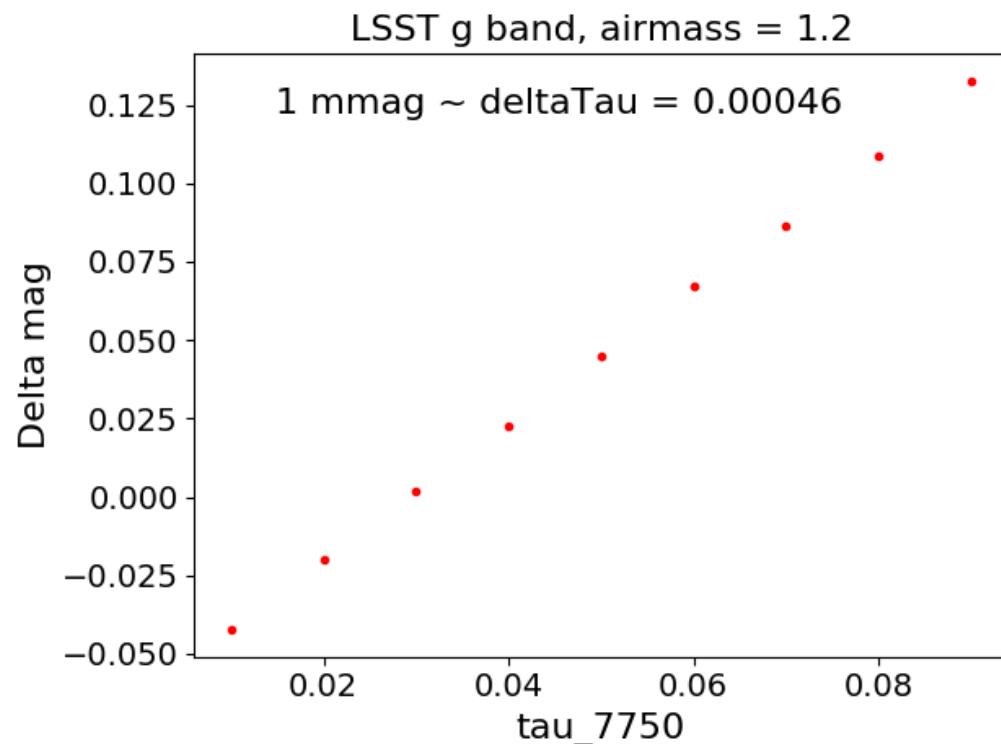
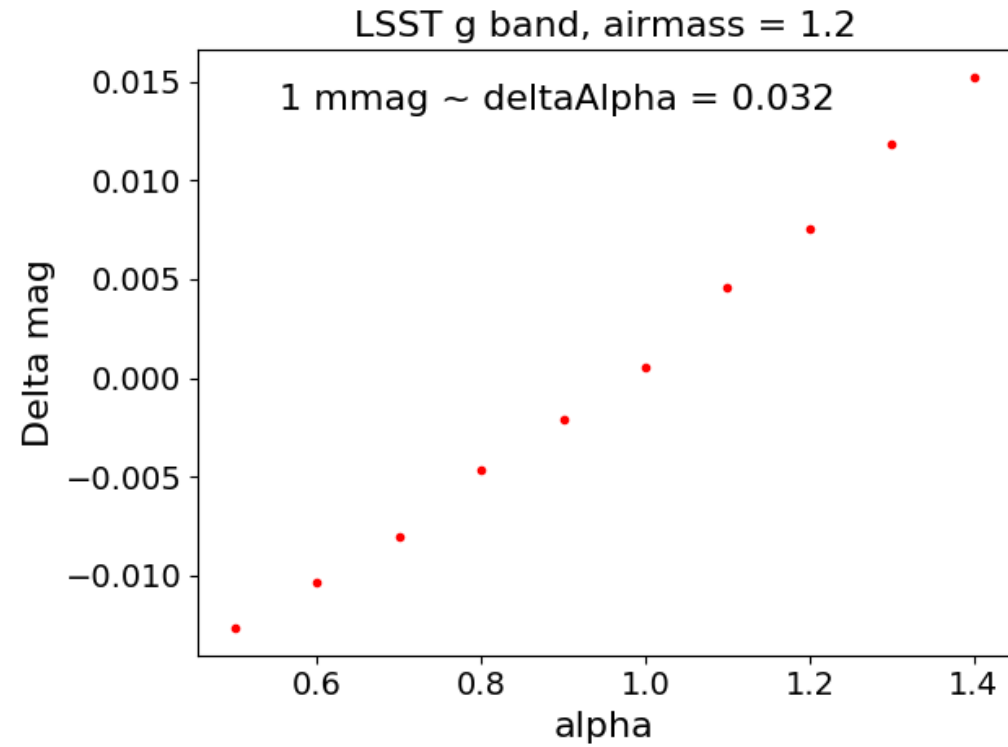
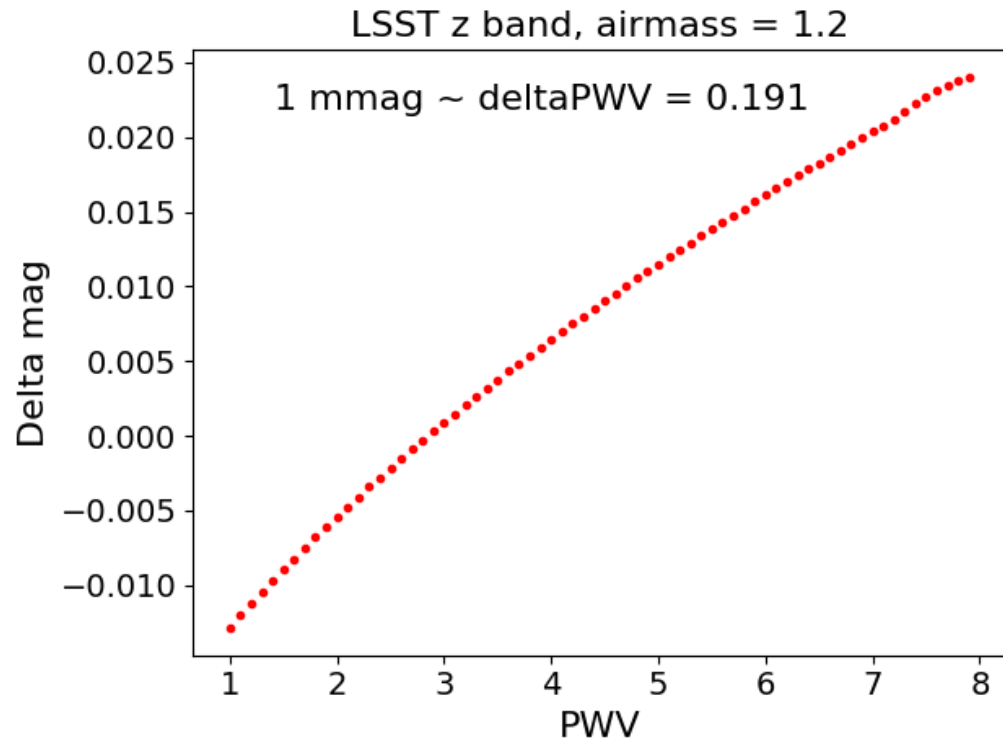


A bit about the atmosphere...

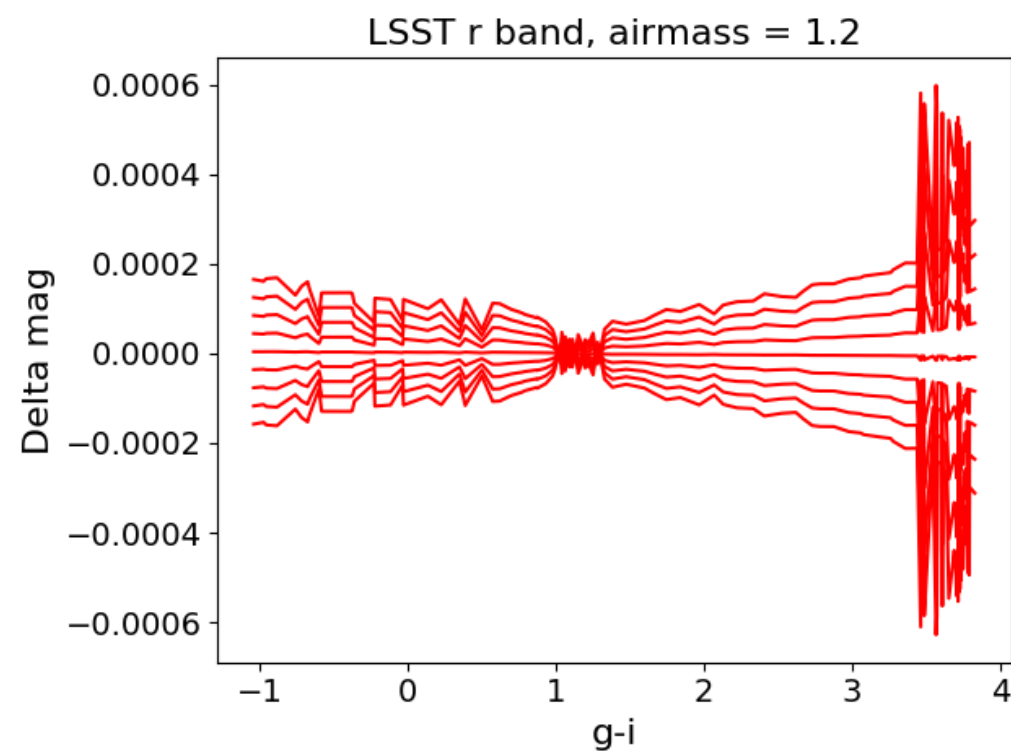
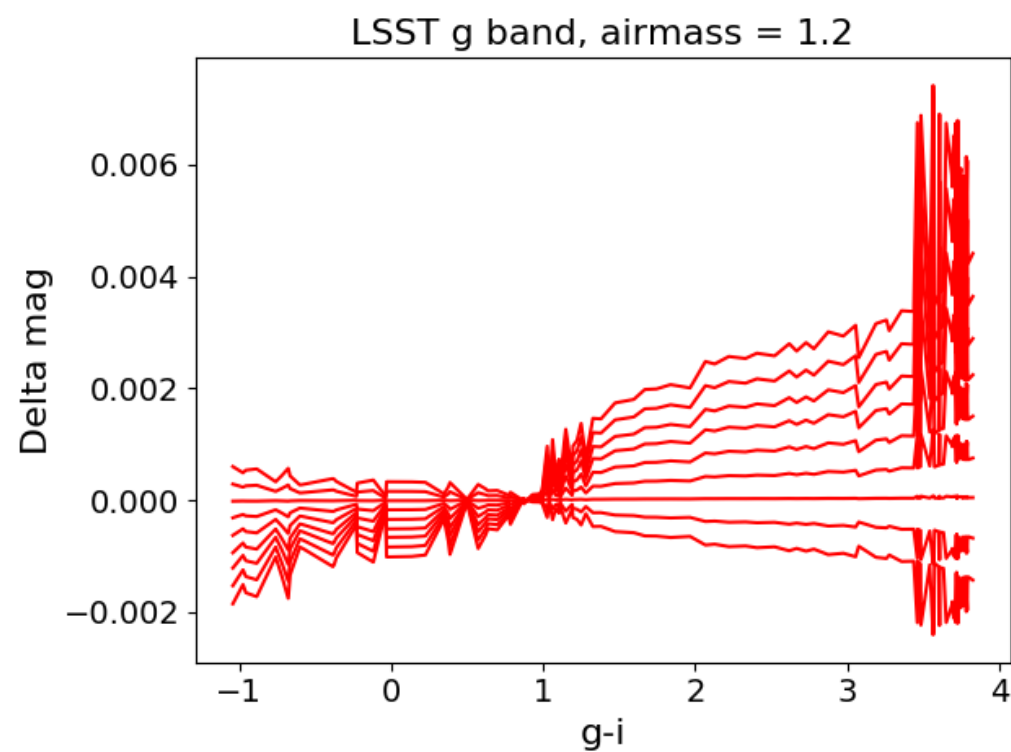
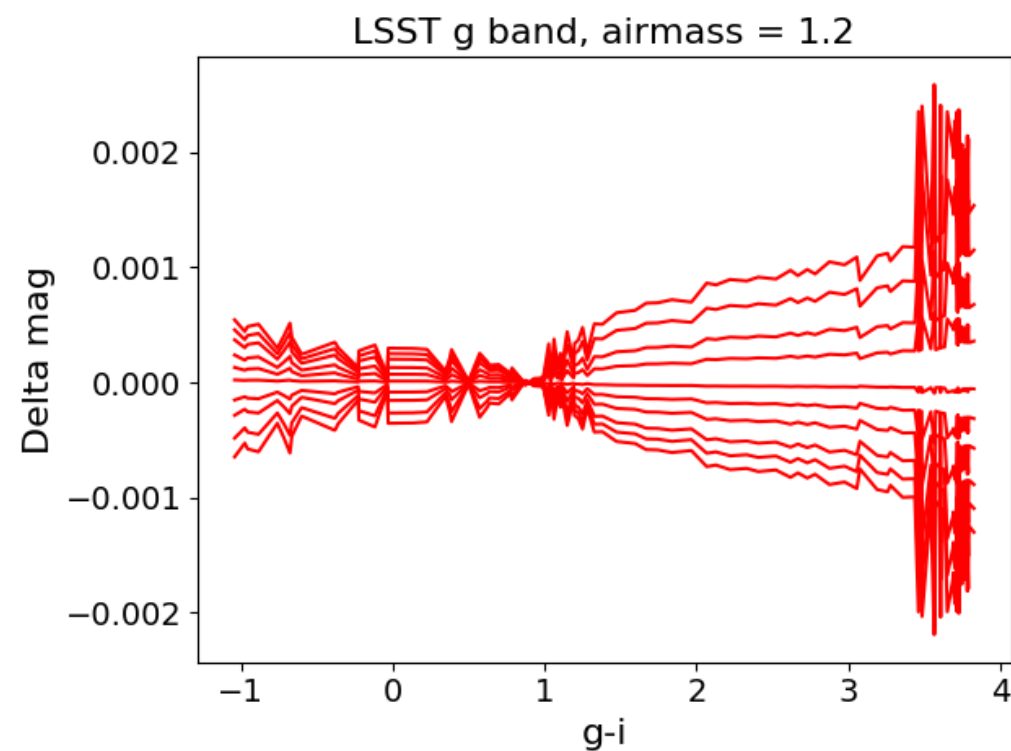
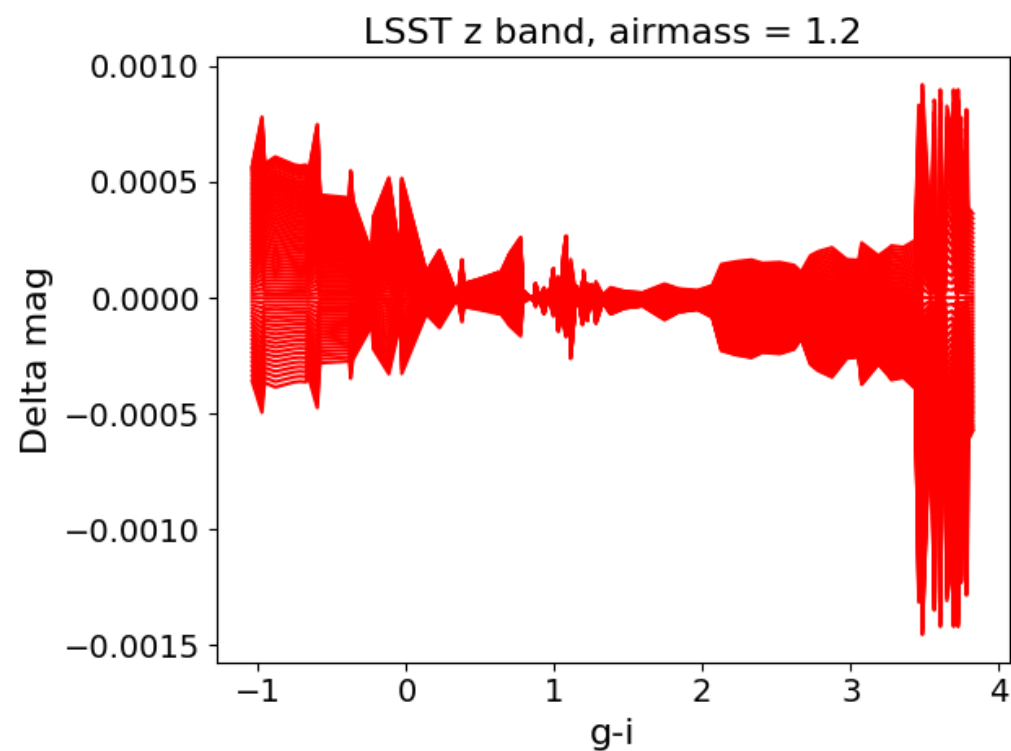


- Following up from the past few days...
- How well do we need to know atmospheric parameters?

For knowing throughput



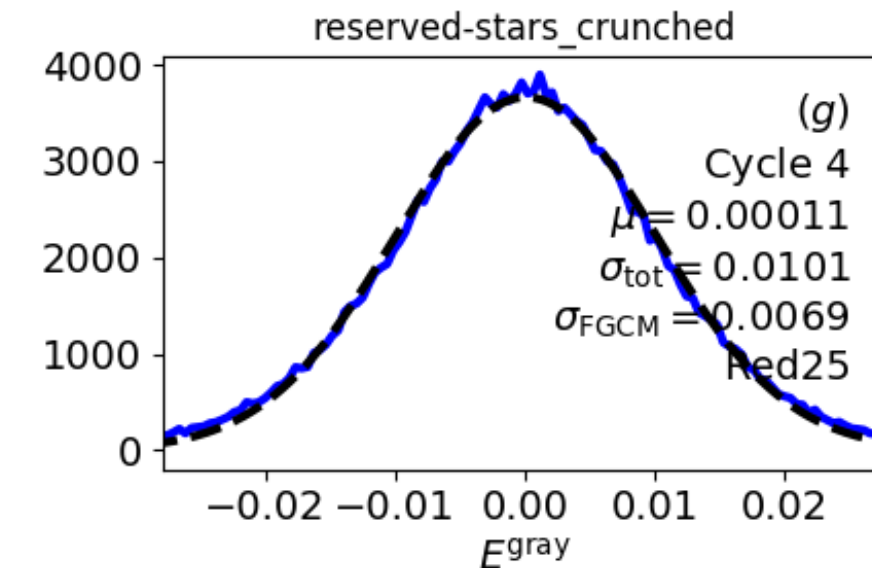
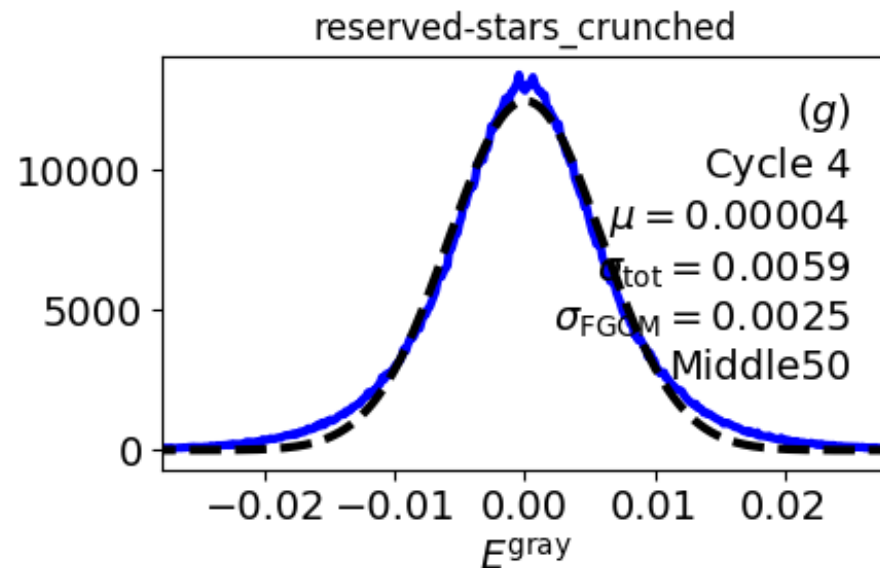
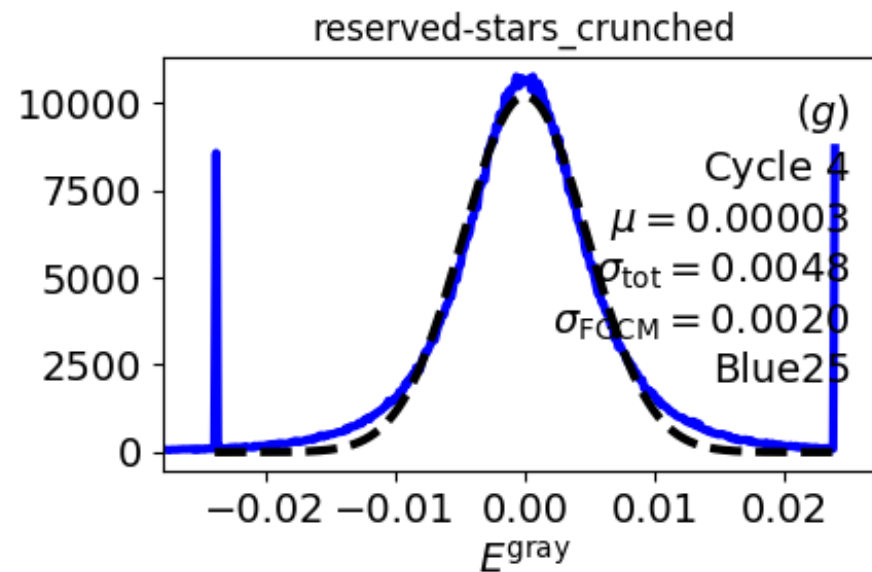
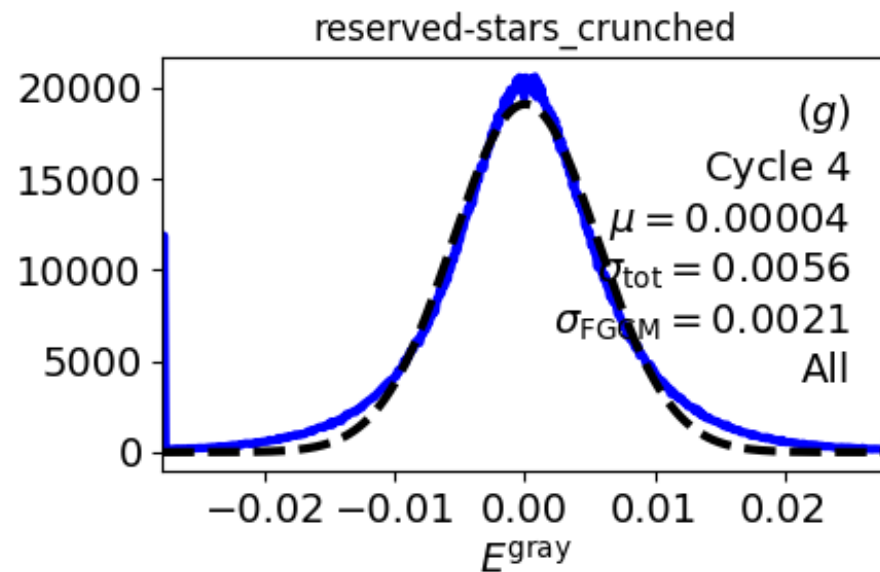
For knowing chromatic corrections



Limitations in DES g-band

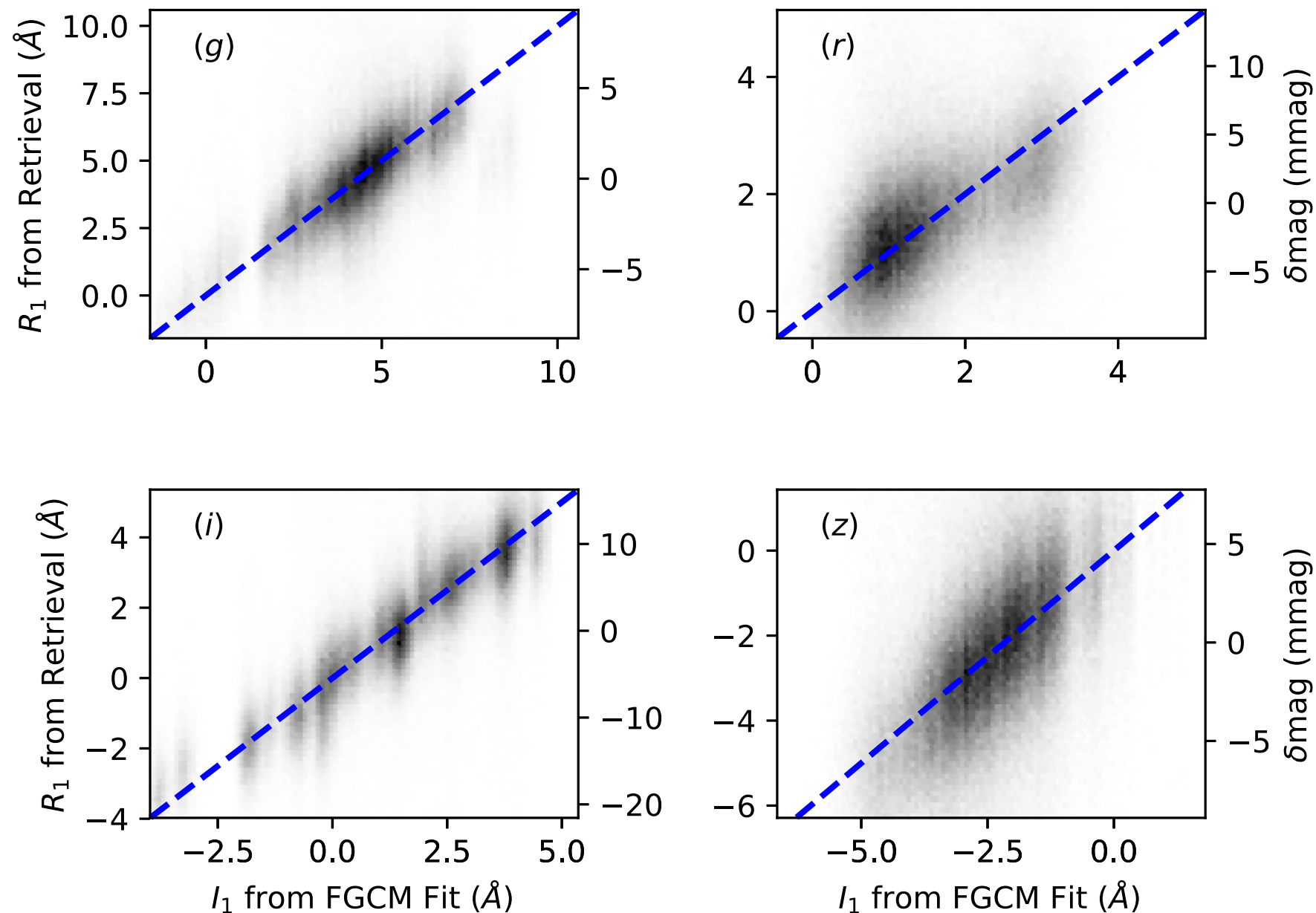


- The repeatability in g is much worse for red stars ...



Instrumental Chromatic Corrections

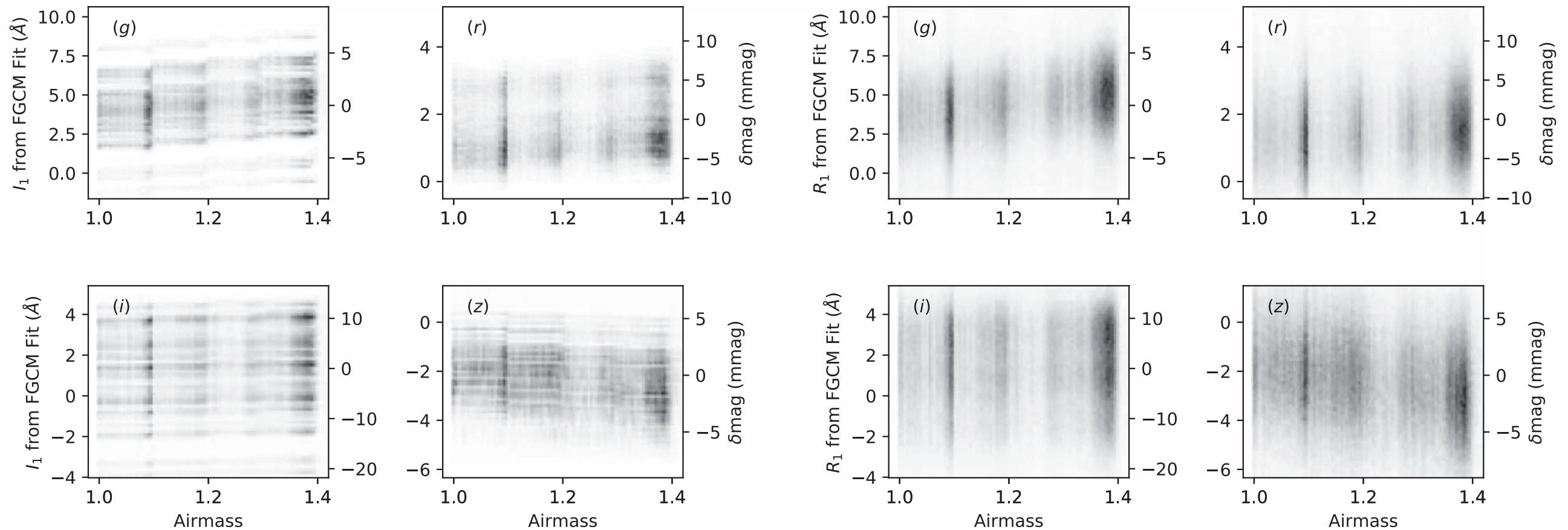
- For DECam these are larger in g , r , and i .



Airmass Color Corrections



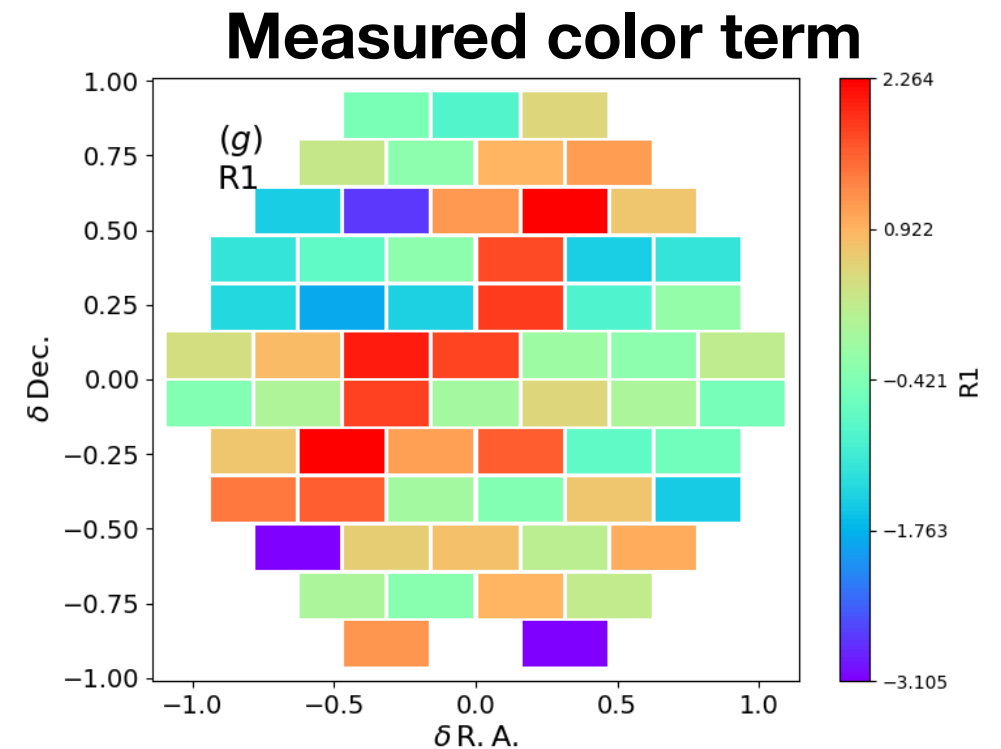
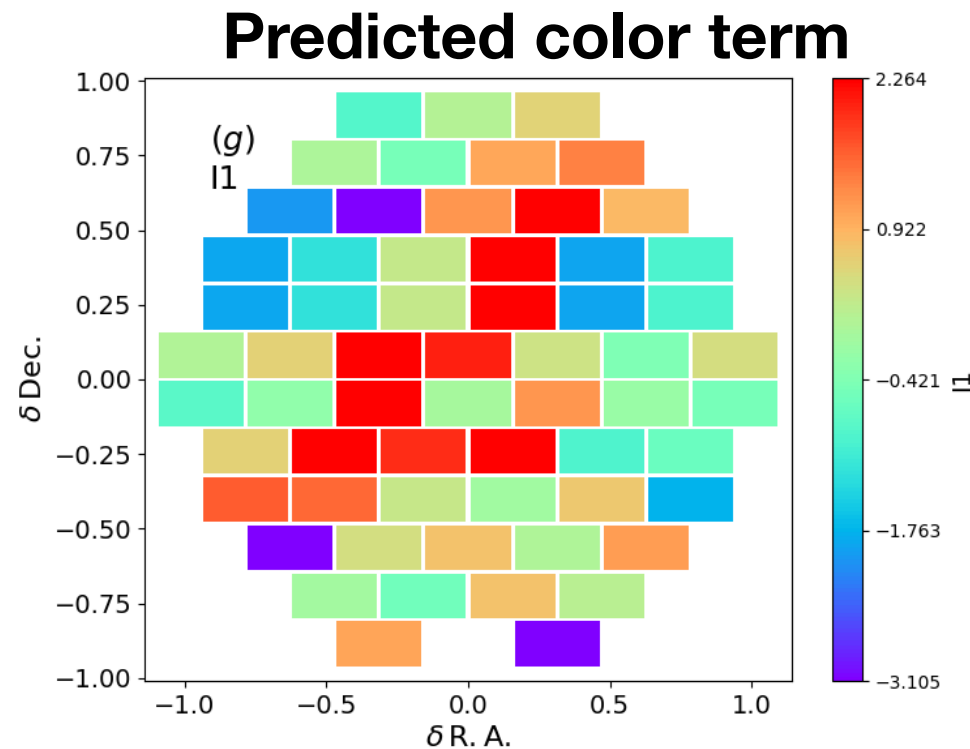
- There is also a small airmass color term (significant at mmag level...)



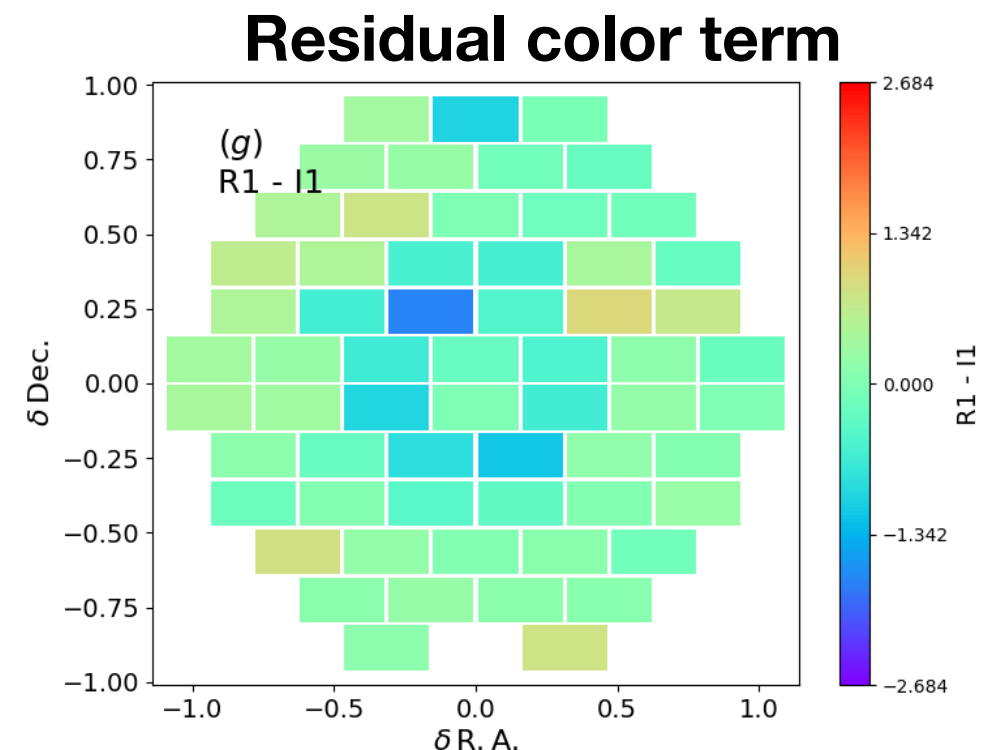
Predicted

Measured

DES g-band color-term residuals



- There are definitely errors in the predicted color term (from DECaI measurements)
- But I don't think it's the whole story...



Impact on SN Cosmology



- We have DES paper coming shortly (Lasker++18)
- Atmosphere corrections average out (and only z-band PWV really matters for DES, and LSST z-band is narrower)
- Instrumental corrections may be a problem (but not for DES Y3)
 - Typically average out, but need to know throughput to transfer absolute calibration!

LSST instrument measurements



- Nicolas has said in the past that we need to know the wavelength calibration of LSST “at the Angstrom level” to get mmag calibrations
- I can assure you that DES/DECam/DECam is not at this level (nor was it designed to be!)
- How are we planning on doing this?