`imaka
a GLAO demonstrator for Maunakea

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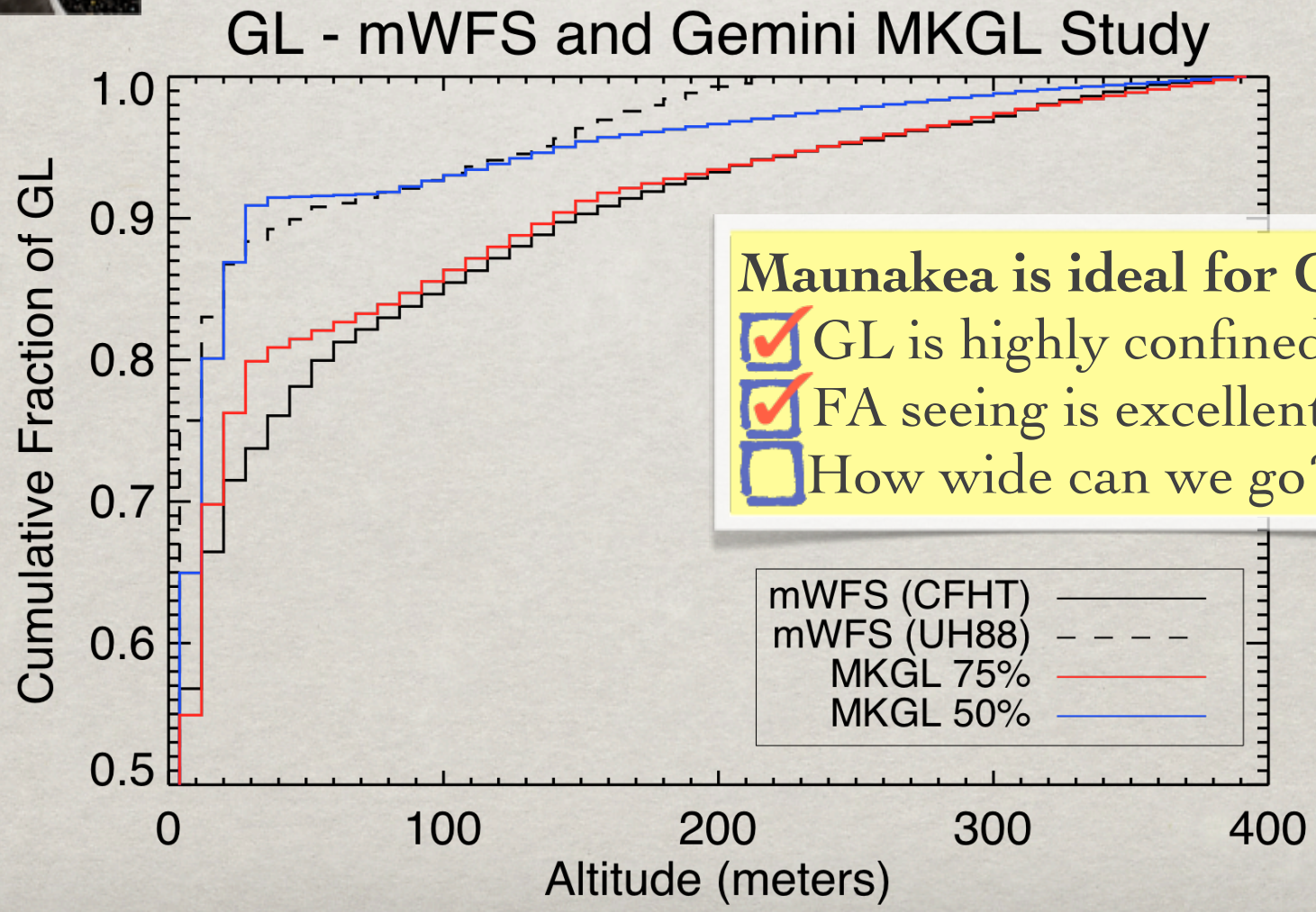
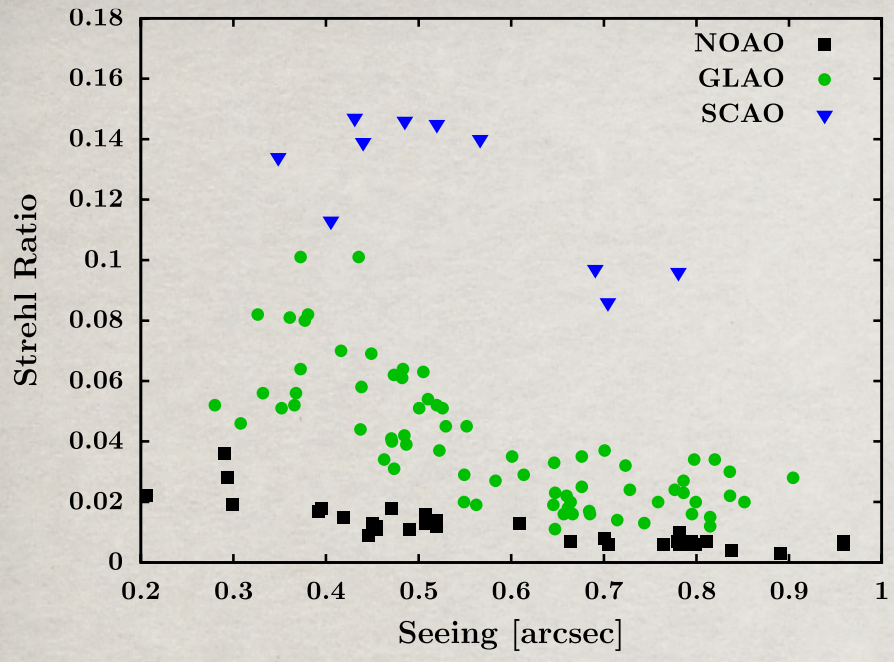
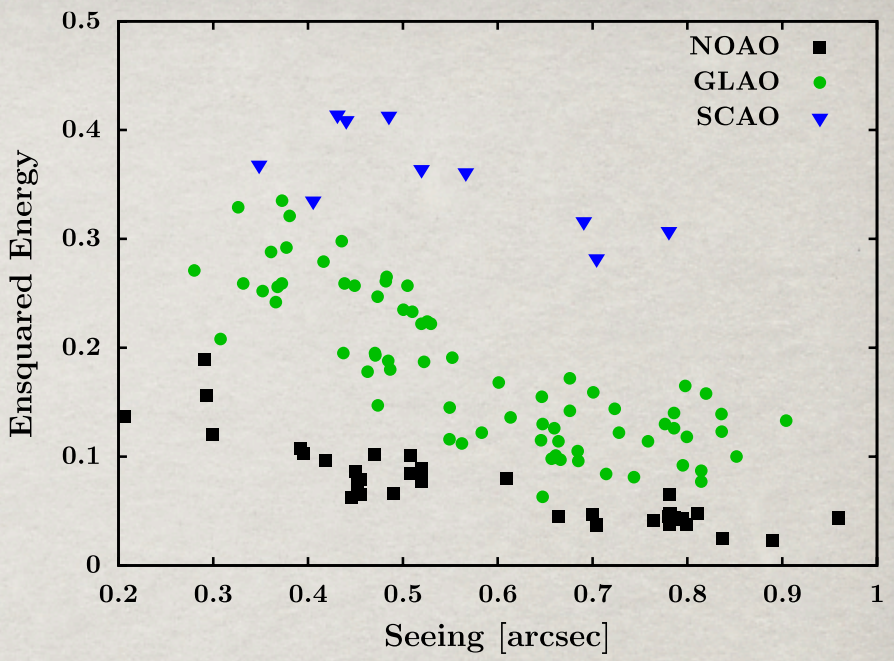
wide-field AO on Maunakea

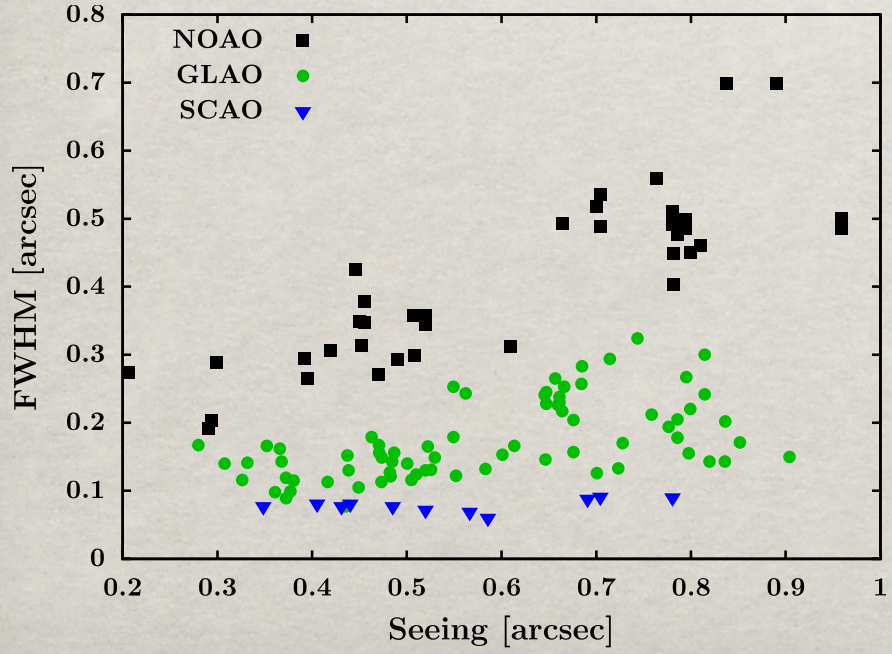


Maunakea is ideal for GLAO

- [x] GL is highly confined
- [x] FA seeing is excellent ~1/3"
- [ ] How wide can we go?



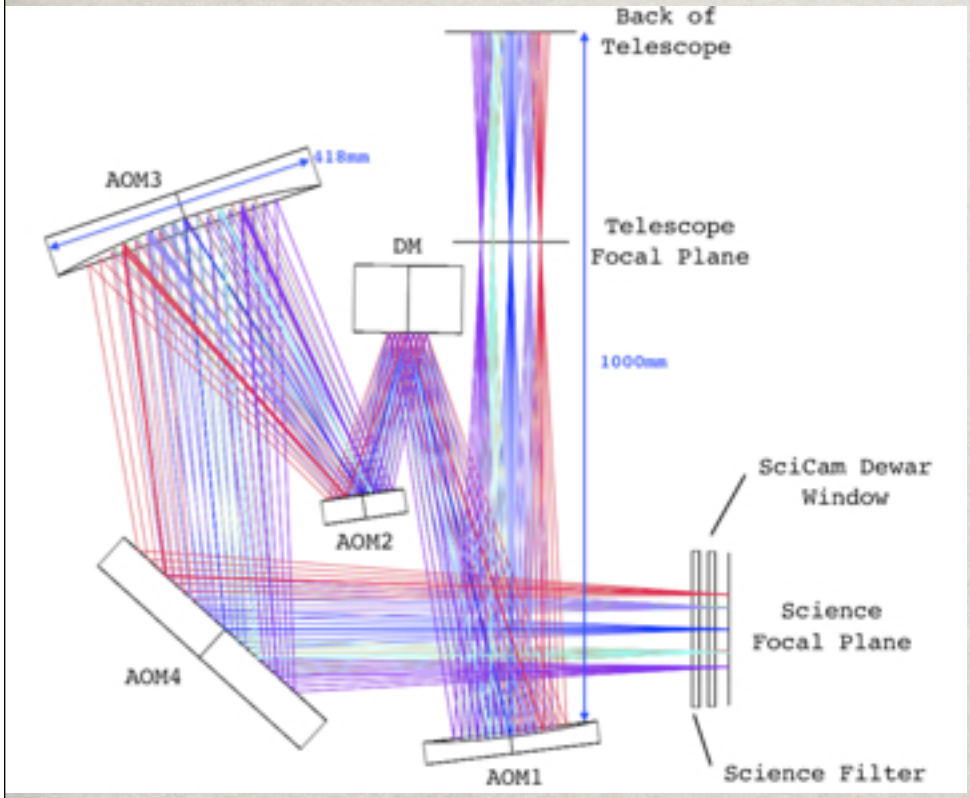


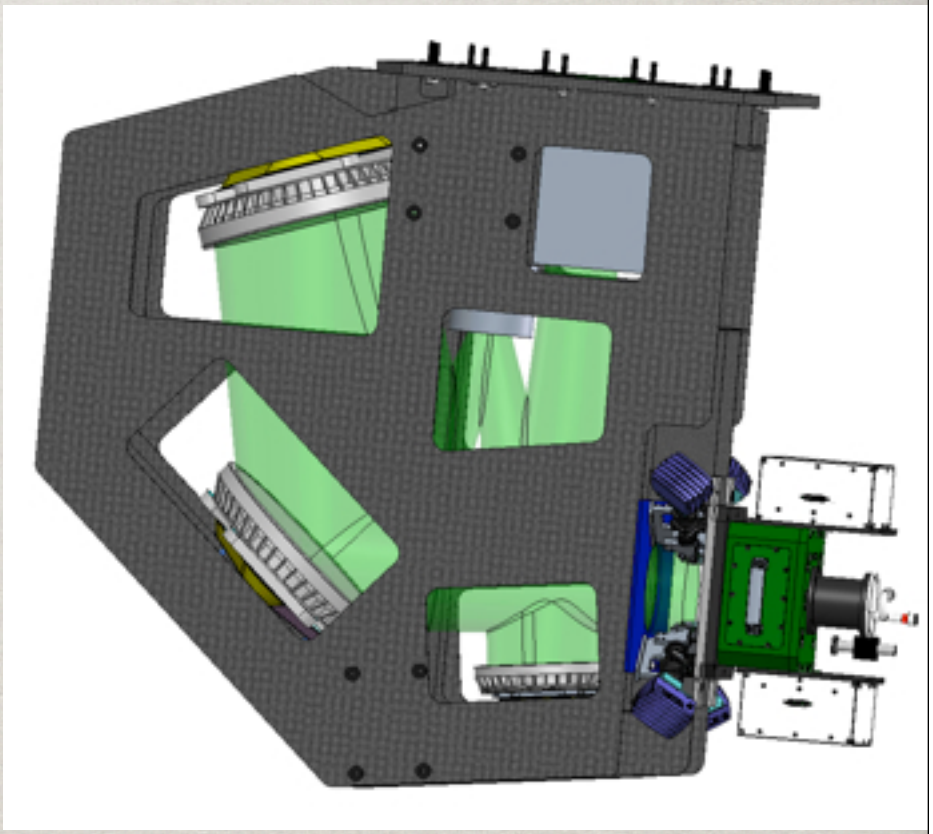


- Only GLAO version
- EE is in a 140max box
- H-band
- 3’ FOV

Plots care of Yoshito Ono, Carlos Correia, and Raven team (2016, Private communication)

GLAO demonstrator on UH88"





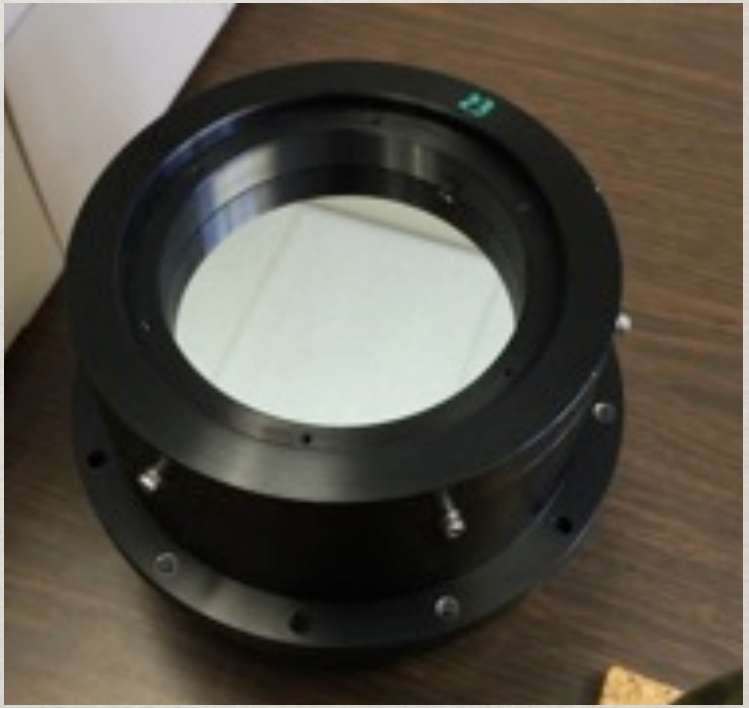
A broken Offner optical design (Baranec)

~1m

mixture of old and new

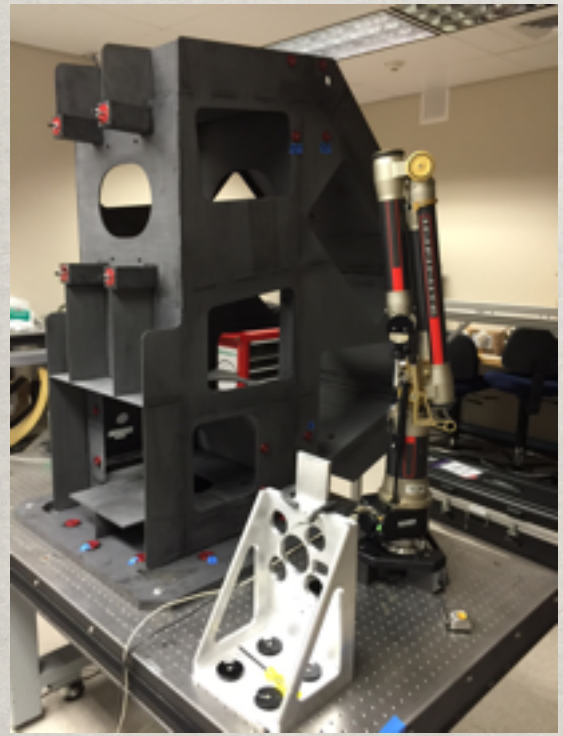
Repurpose the Wavefront Sensors from CFHT mWFS Experiment - Five 8x8 subap SHWFSs

Repurpose the Deformable Mirror from Subaru AO36 - 36 curvature actuators

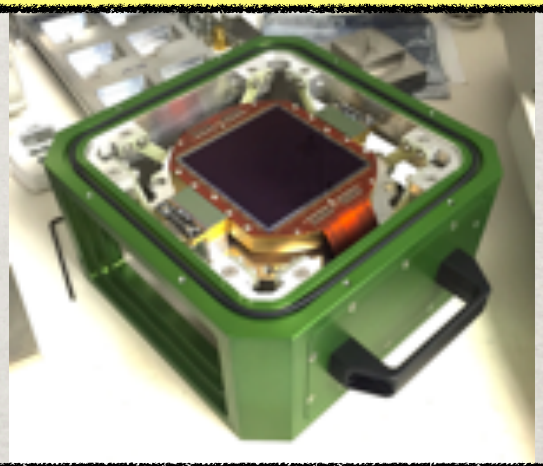


mixture of old and new

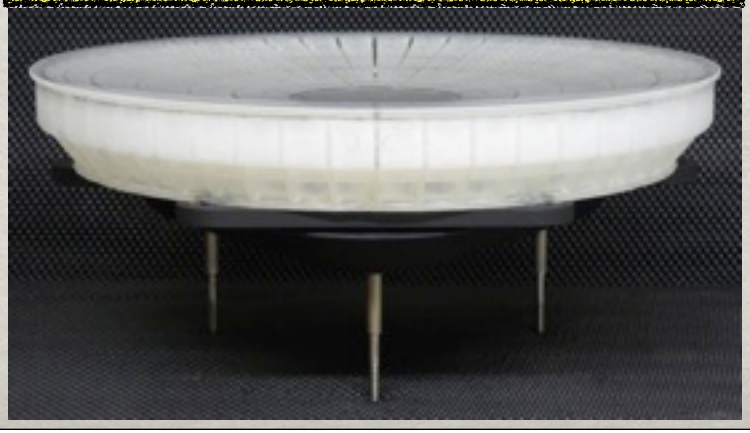
Carbon-fiber Structure - weight and CTE issues v. hygroscopic and machine tolerance issues



STA1600 – 10k x 10k CCD camera for UH88 (11'x11')

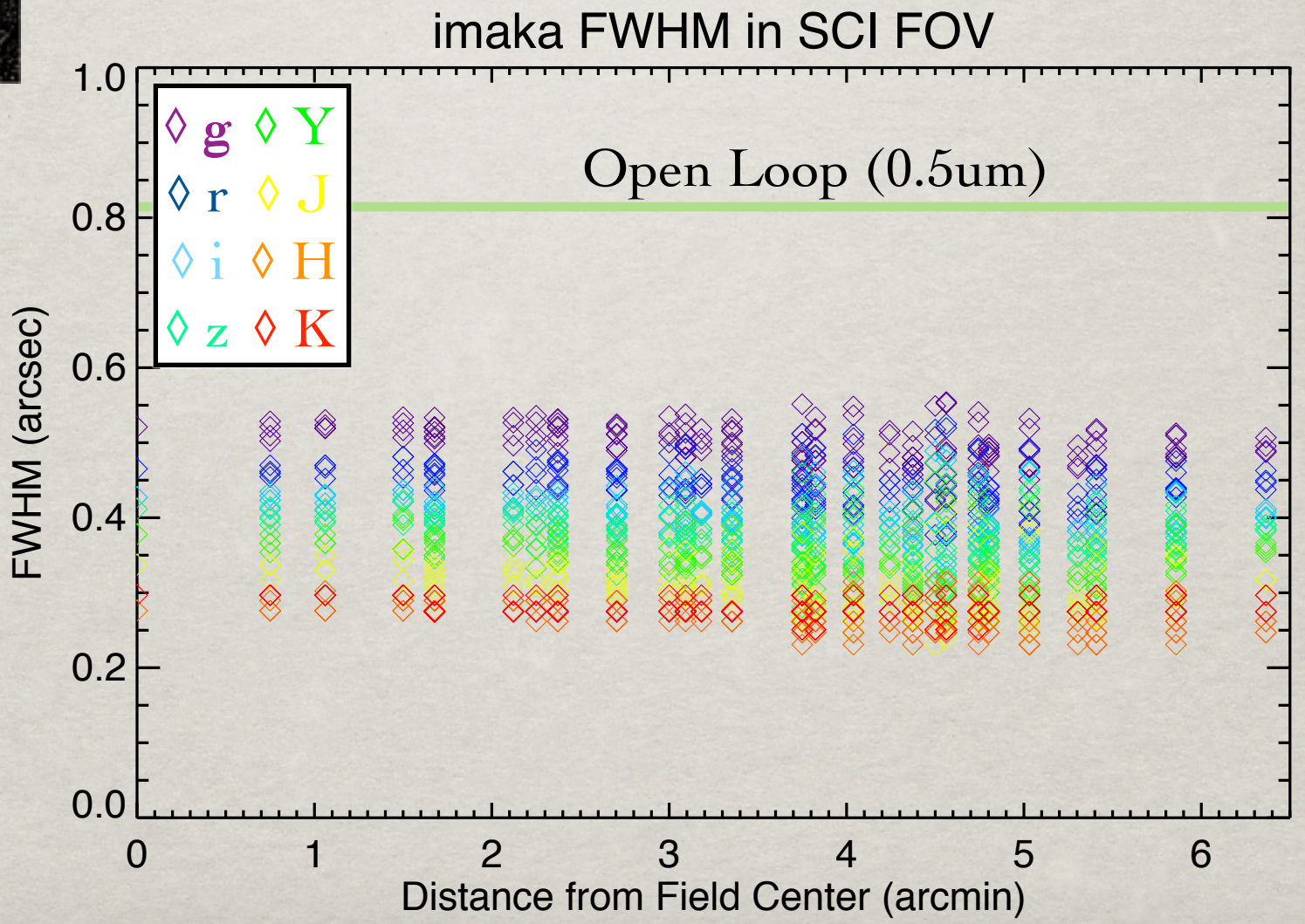


∅16" light-weighted mirror with carbon-fiber whiffle tree

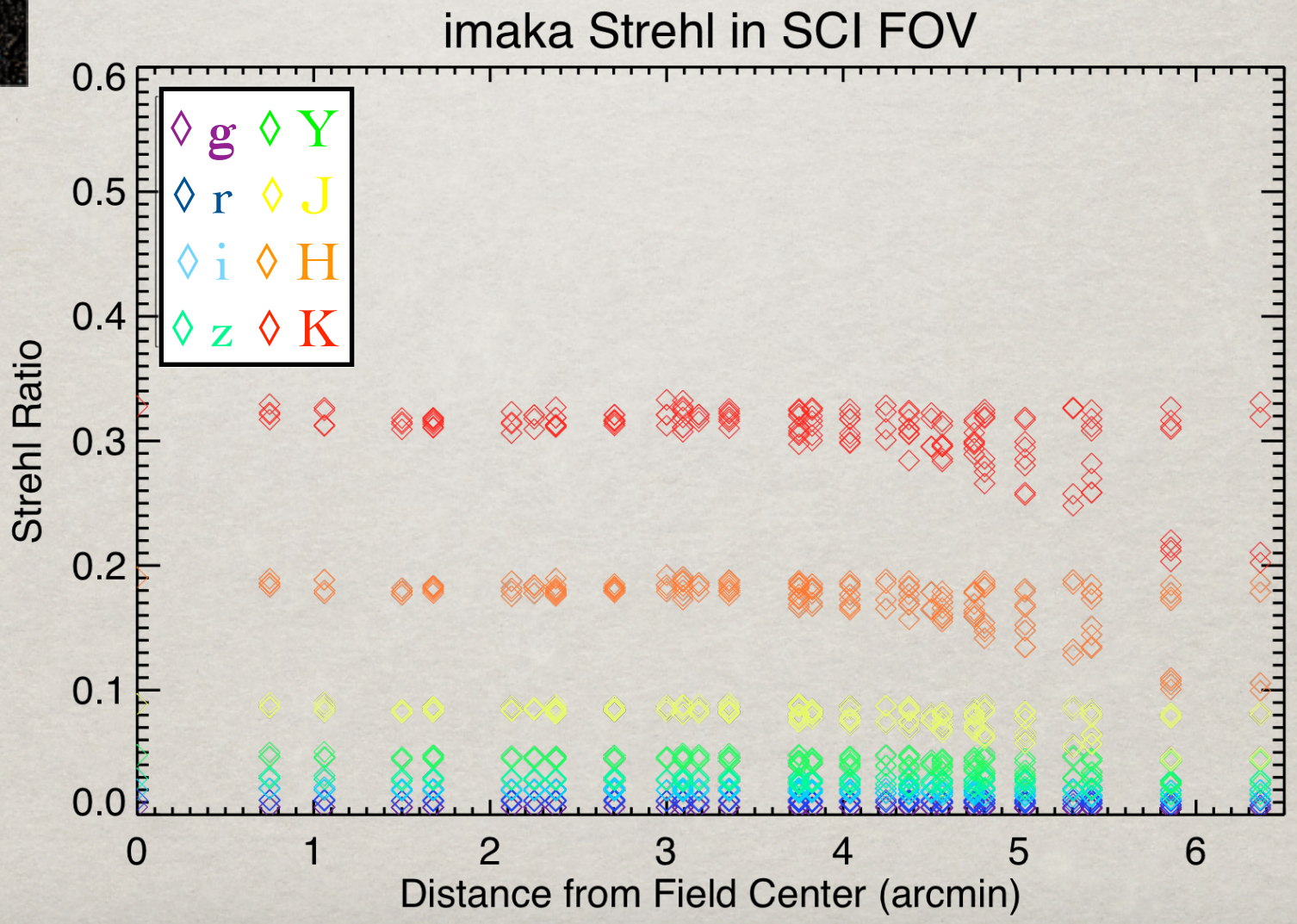


D. Hall H4RG-15 camera (7'x7')

GLAO demonstrator on UH88"



GLAO demonstrator on UH88"



A demonstrator/ testbed for GLAO

- **Operational constraints**
  - Need natural guide stars (3-5) R< ~11
  - WFSs are fixed on a “plug-plate”.
  - We will observe only 1-2 fields per night.

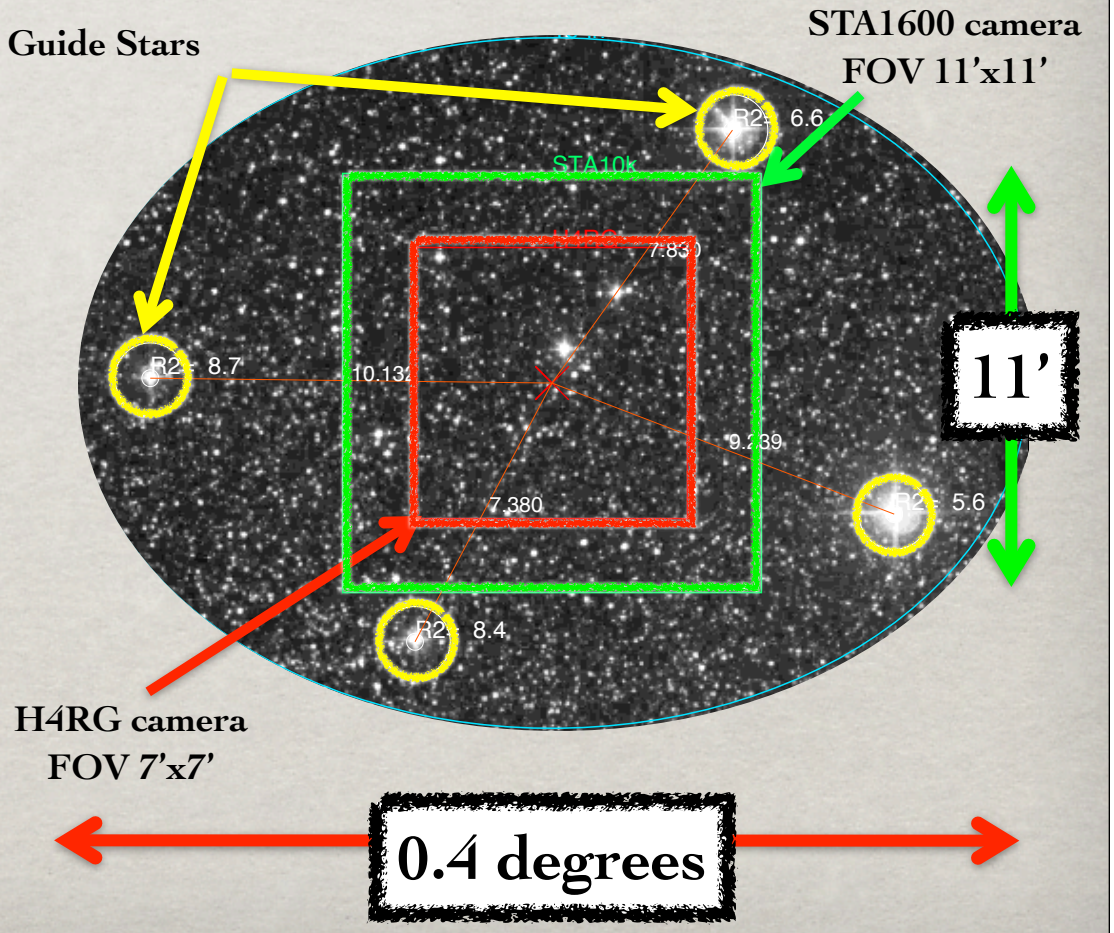
A demonstrator/ testbed for GLAO

- **Experimental flexibility** - Entrance and exit focal planes can be configured for whatever we want - supports multiple science cameras, additional/ high-order WFSs, multiple calibration units, others...

Demonstrating GLAO

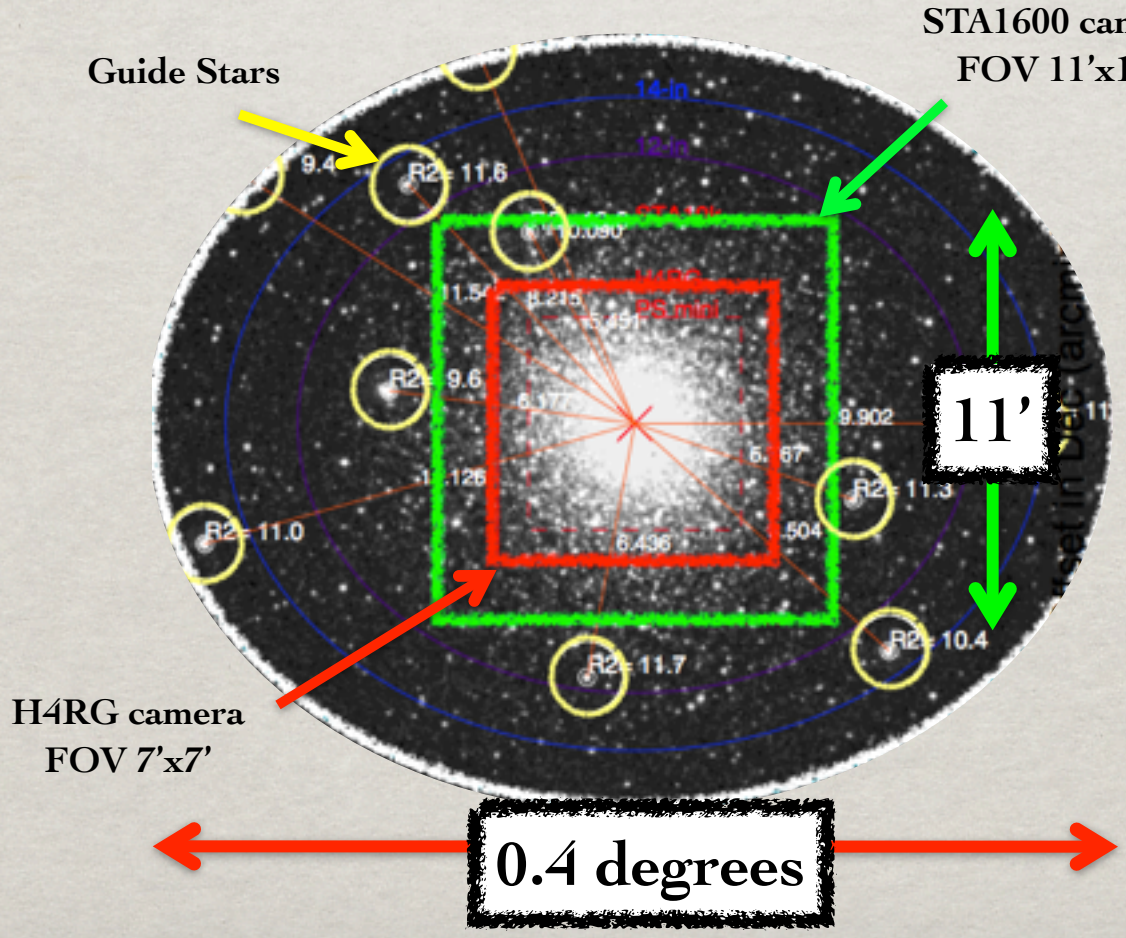
- **Quantify GLAO v. GS field**
- **Measure PSF/Science Gain**
  - wavelength/time/field dependence,
  - seeing/OTP dependence
- **Test GLAO controls**
  - GS asterism dependence
  - tomography/averaging

`imaka on M92



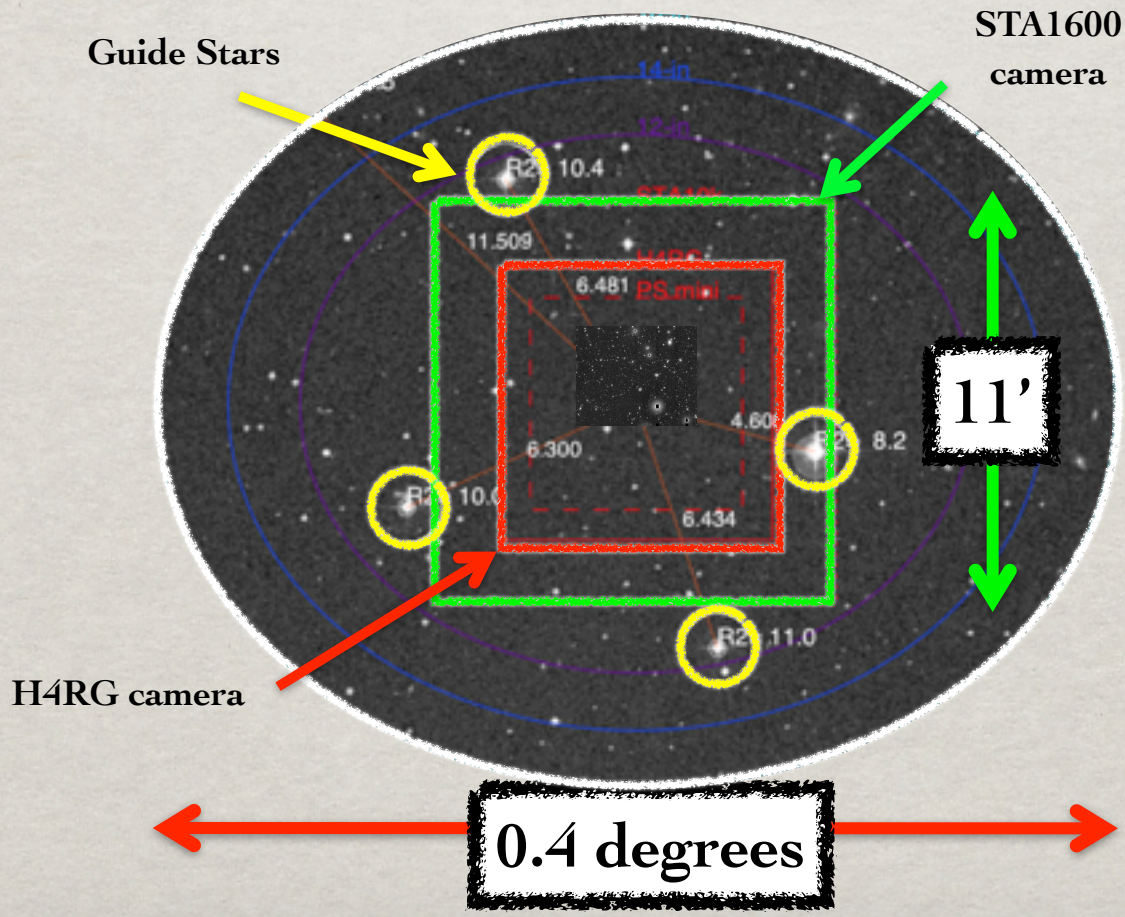
Demonstrating GLAO science

`imaka on M92



Demonstrating GLAO science

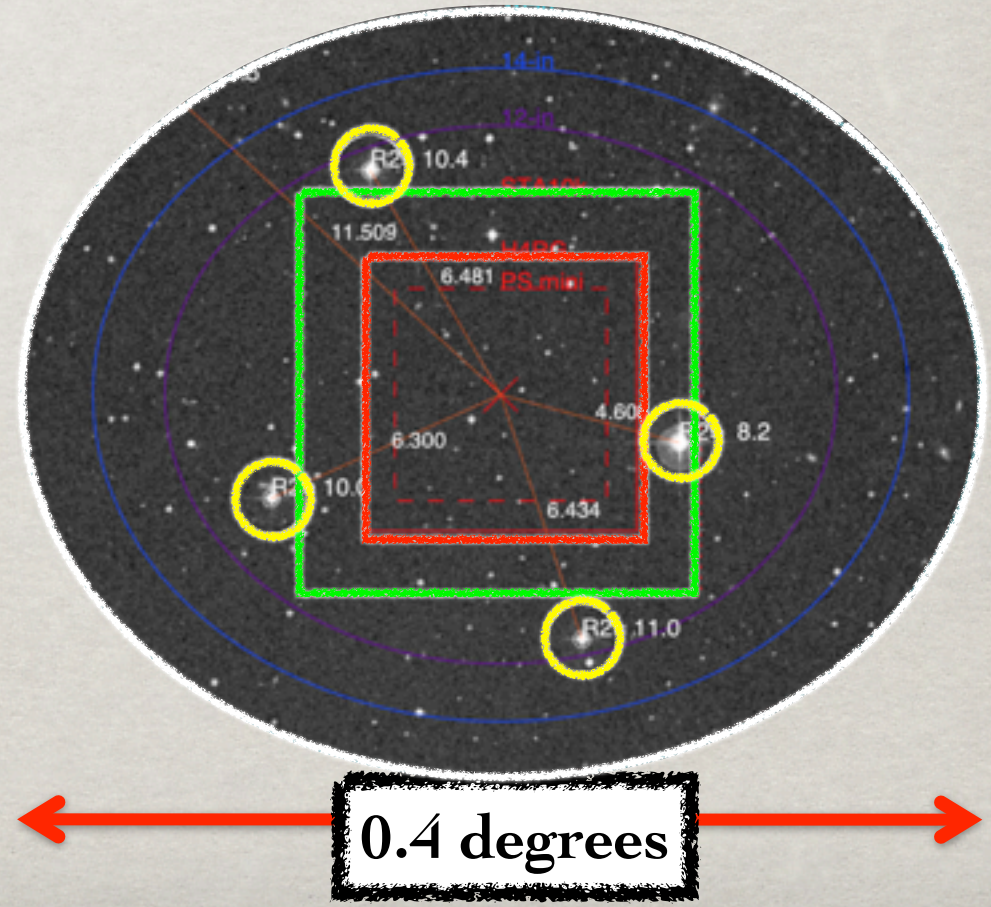
`imaka on COSMOS



Demonstrating other techniques...

- starbug WFSs (AAO)
  - push sky coverage
  - MOAO experiments
- starbug IFUs
  - demonstrating GLAO +dIFUs
- OTCCD
- R-LGS?
  - full sky coverage
  - LTAO experiments

`imaka on COSMOS



Schedule

- Integrating in lab now
- on-sky this fall
- GLAO ~ October
- start of demo science 17A
- We are interested in further collaborations to help ULTIMATE-Subaru

`imaka on COSMOS