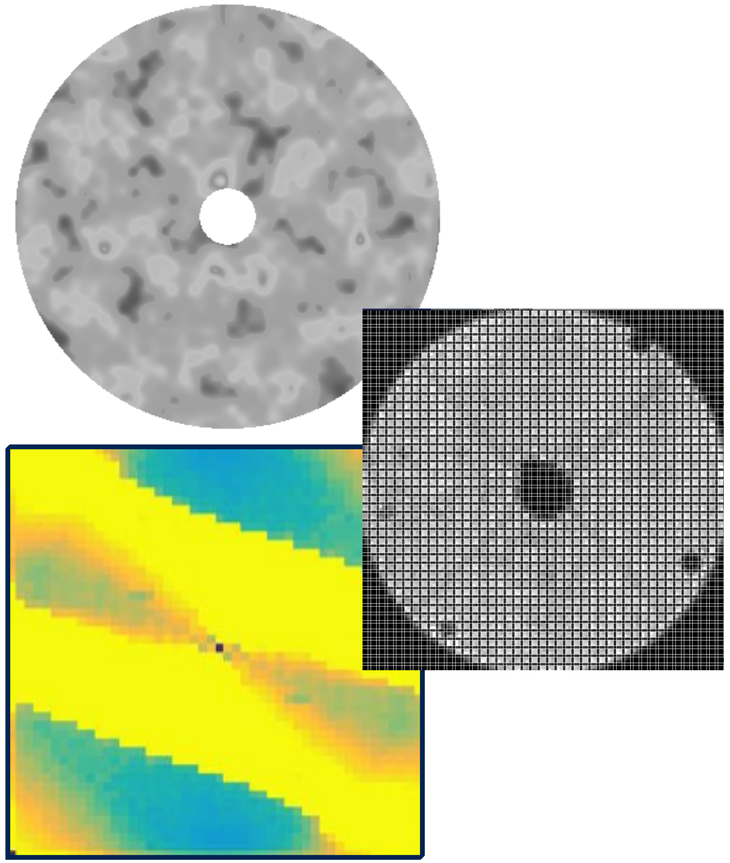
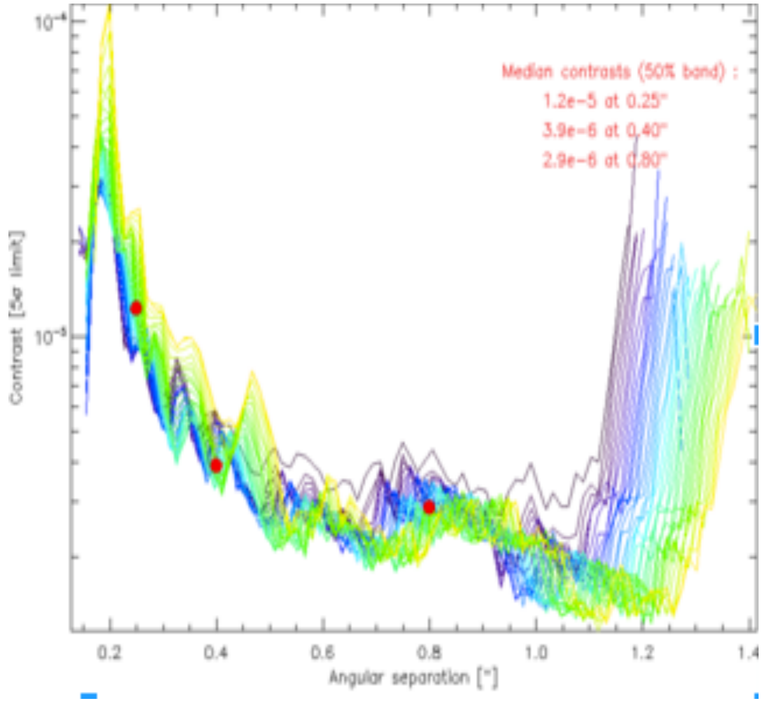
AO telemetry & performance

Caution: Ground-based bias!





Vanessa Bailey
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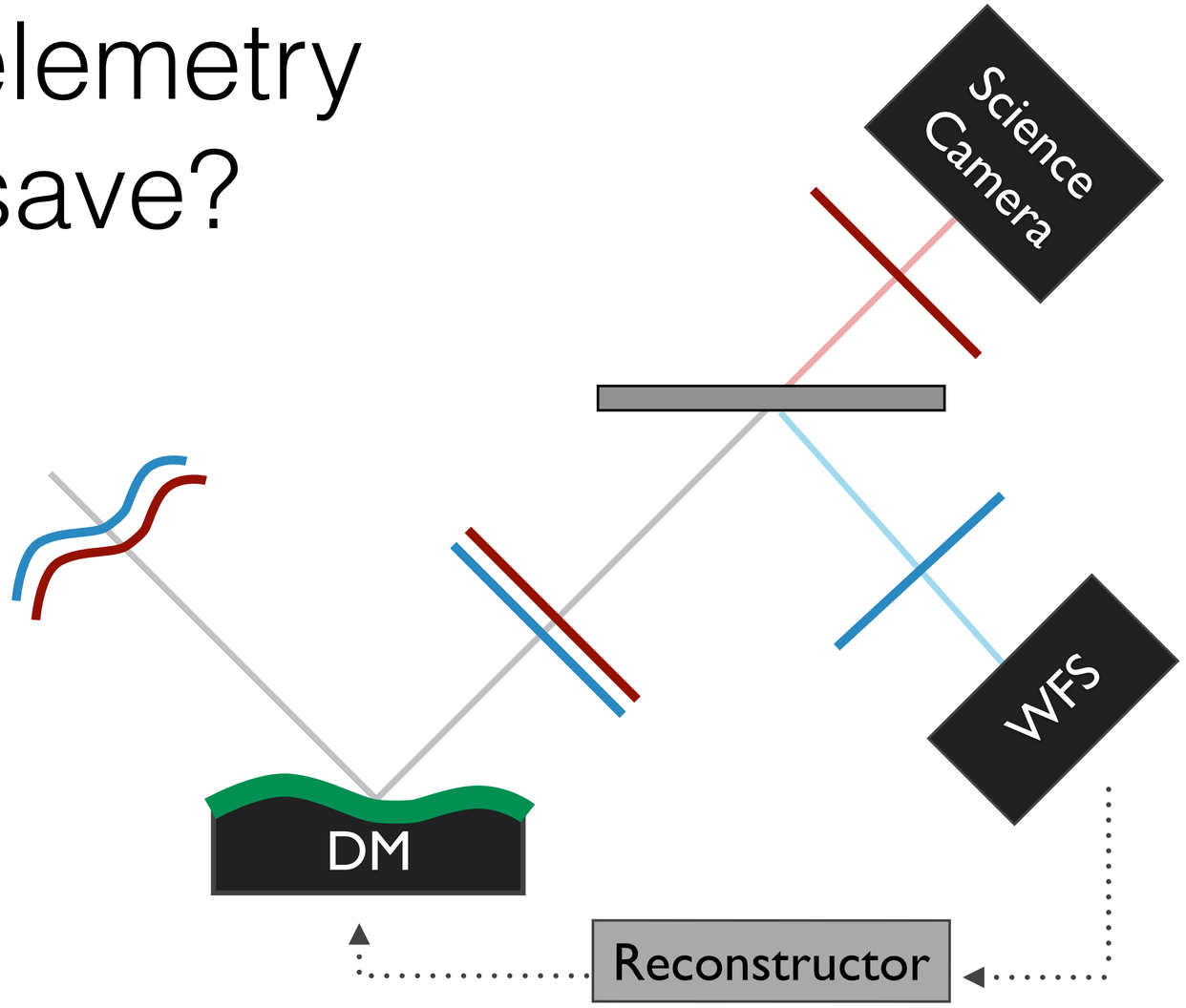
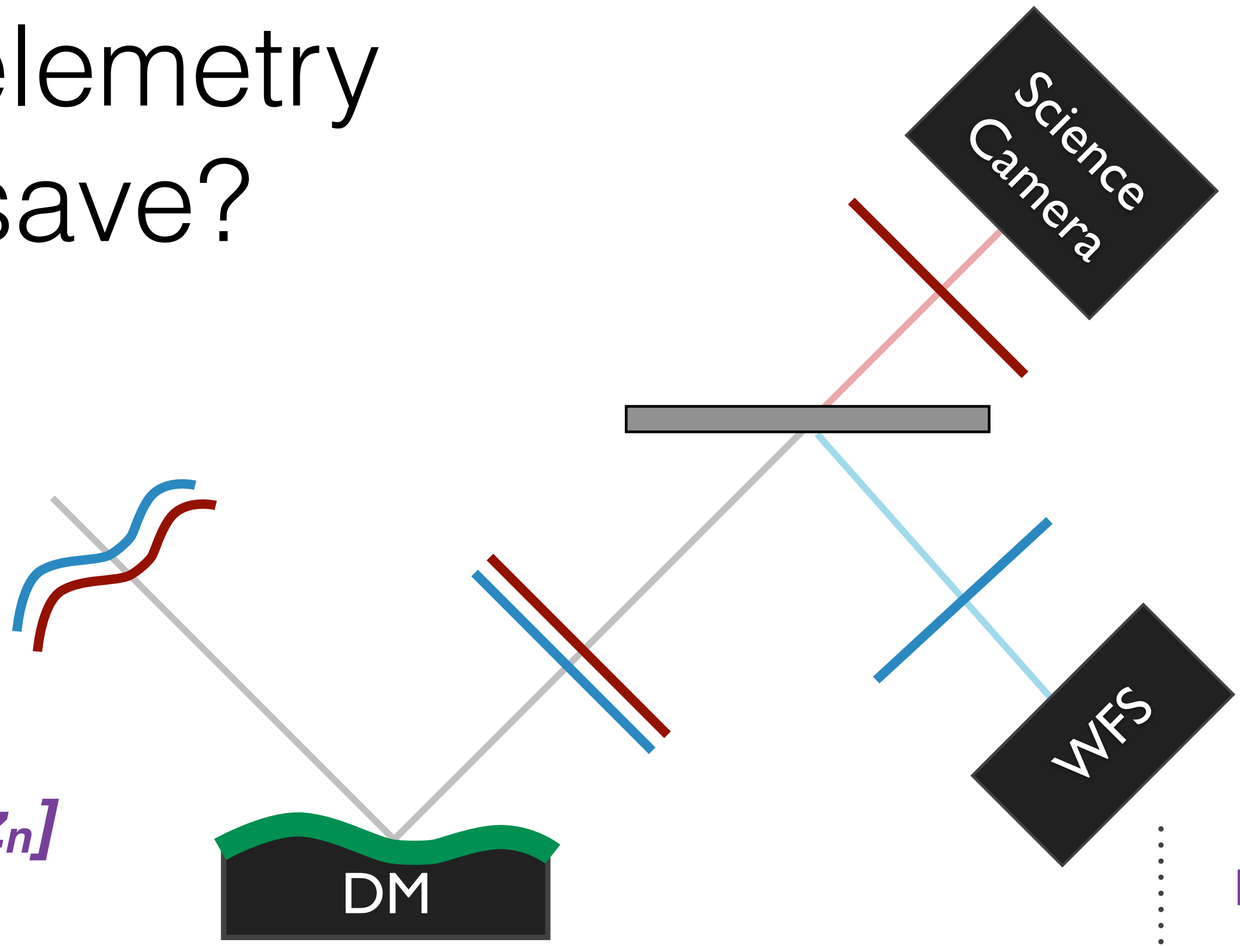
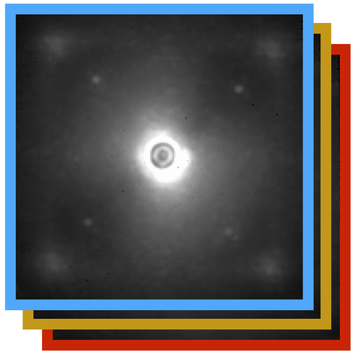
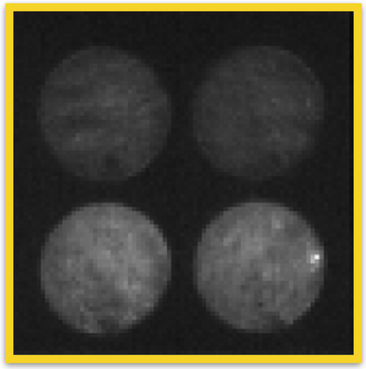
What AO telemetry can we save?



What AO telemetry can we save?



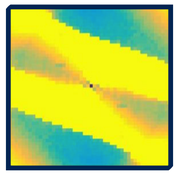




positions: [$z_1 \ldots z_n$]

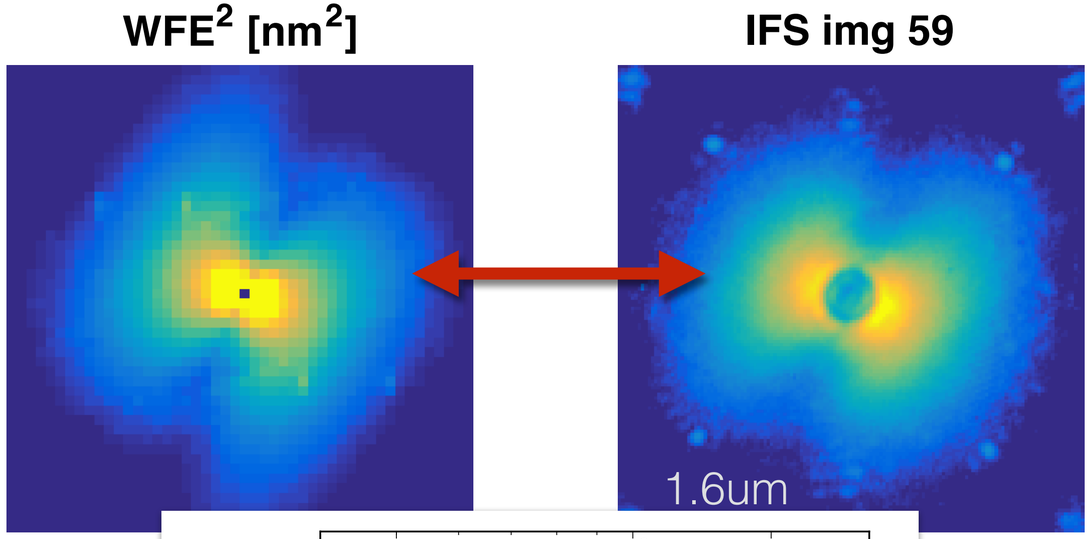
residual slopes:
[$x_1, y_1 \ldots x_n, y_n$]

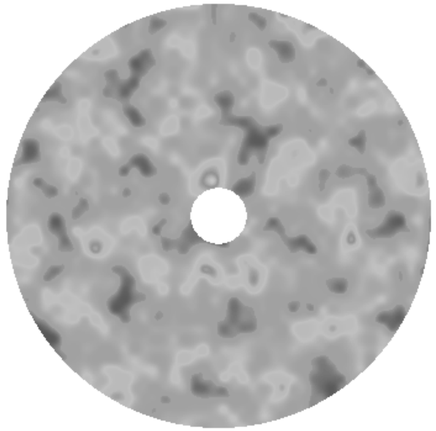
commands:
[$z_1 \ldots z_n$] or [$m_1 \ldots m_n$]

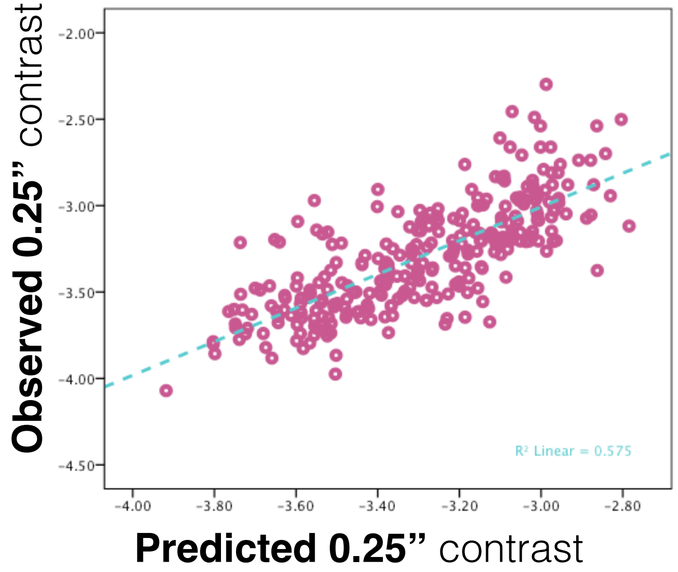


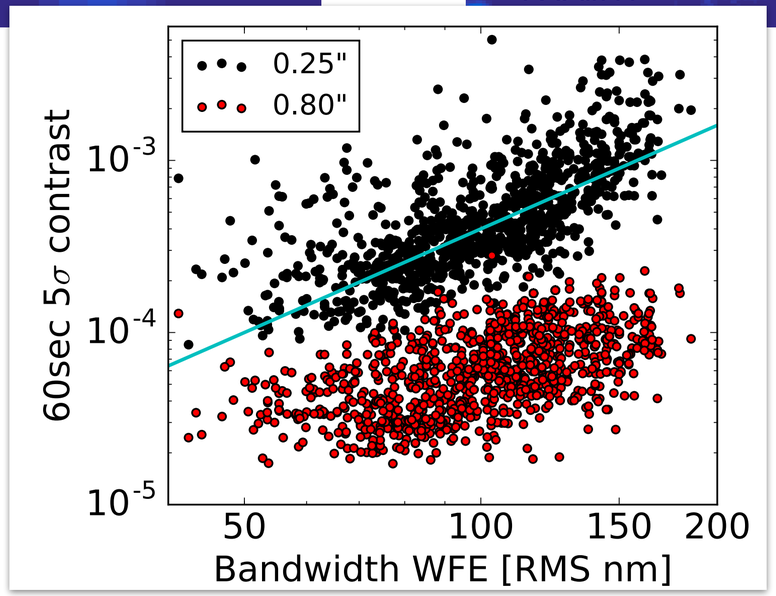
modal gains

Poster plug: what does GPI do with AO telemetry?







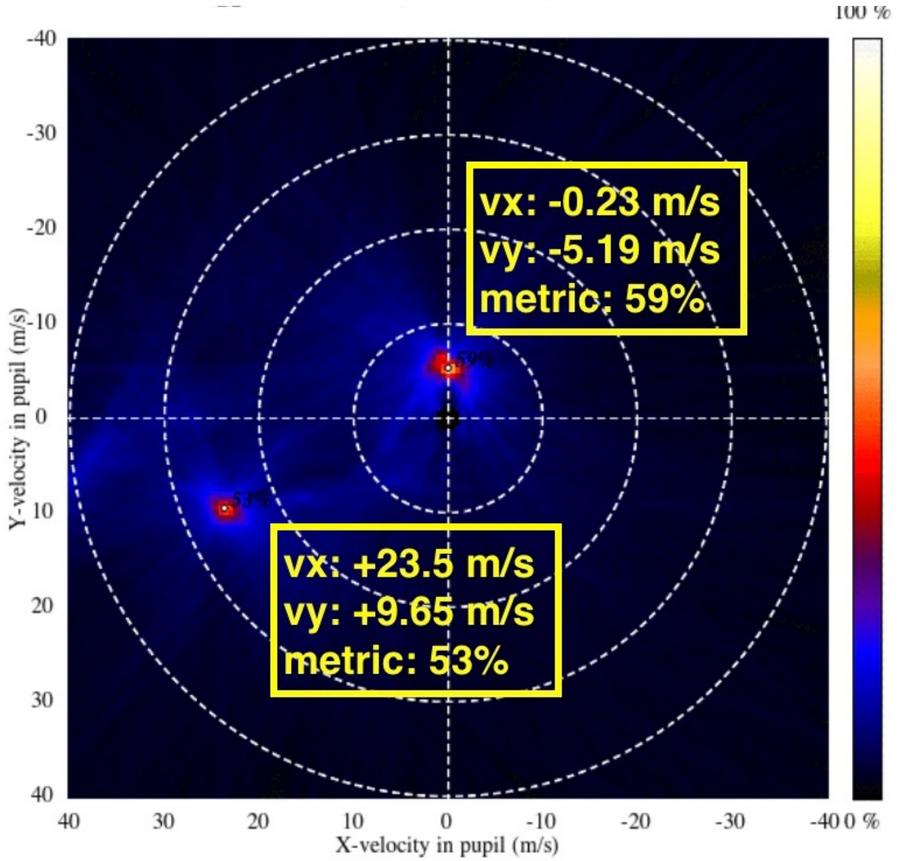


What limits my contrast at #”?
Target instrument improvements.

Queue observing: when to execute?
How to optimize survey strategy?

Tangent: site characterization

- Regular AO telemetry = regular site monitoring (postprocessing required!!)
- Compare to observatory MASS, DIMM, etc.
- planning upgrades &/or new instruments (AO and seeing-limited)
- What datasets exist for other AO instruments and/or sites?



Sri Srinath - SPIE 2016
Adam Snyder - SPIE 2016

What AO telemetry do we actually save now?

- most AO data isn't saved!
  - data rate of 100MB to >1GB / minute for high-order systems
  - manually triggered sets. Few sec to a few min, a few times per target. Sparse sampling!
- lots of AO data is unprocessed!
  - pipelines, databases required but not often allocated resources
  - Design systems for simplified analysis? (eg: Fourier basis sets?)

What is the minimal AO data we need to save?

- Analyze system performance?
- Complement focal plane WFS?
- Complement data reduction?
- What cadence?
- Save everything? Realtime process?
- S/N & error tolerance?
- ?

ground vs. space?

How to use current systems?

- Reach specs on *current* systems
  - Develop AO telem pipelines & infrastructure
  - Identify factors limiting *astrophysics*, not WFE
- What can we test with existing systems?
- ??