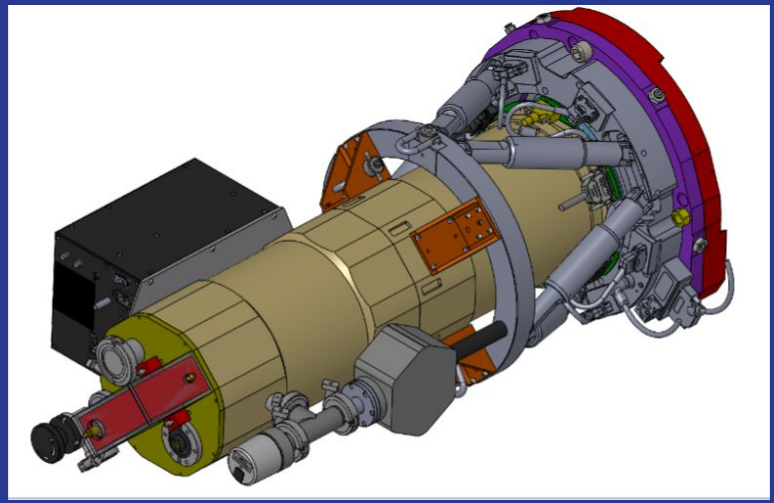
DEIMOS Throughput Upgrade

Principal Investigator: Evan Kirby (Notre Dame)
Project Manager: Mitsuko Roberts (Caltech)



Funded by the California Association for Research in Astronomy (CARA)

Collaboration structure

Mechanical engineering

- Dave Cavalieri
- Matt Engstrom
- Lauren Henderson
- Evan Kirby (PI)
- Josh Holewczynski
- Jim Smous
- Alexander Sterling

Electrical & mechanical engineering, project management

- Tim Greffe
- Prakriti Gupta
- Roger Smith
- Don Neill
- Rishi Pahuja
- Mitsuko Roberts (PM)
- Bob Weber
- Ray Zarzaca
- Jake Zimmer

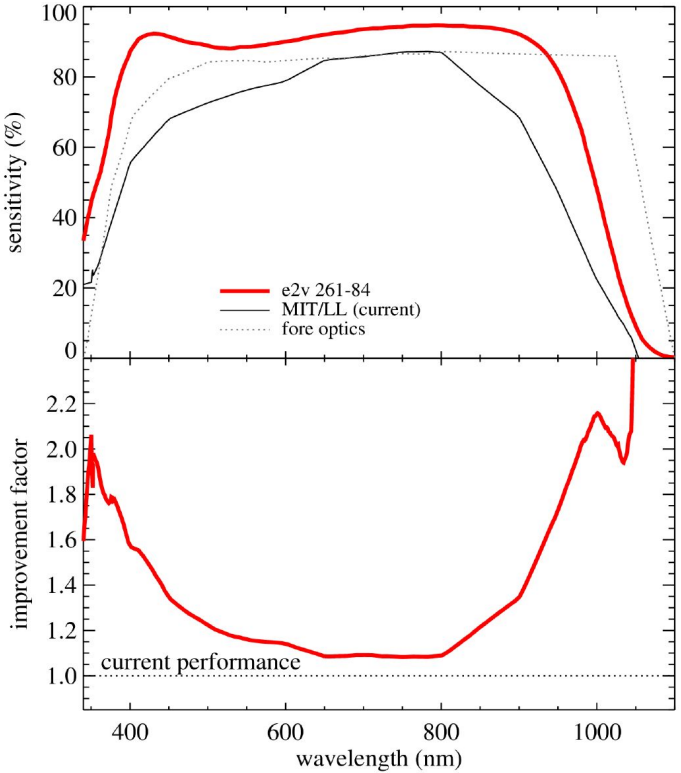
Software

- Will Deich
- Nick MacDonald
- Connie Rockosi

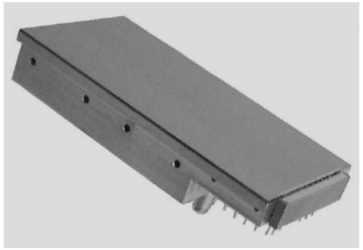
Requirements, assembly & installation

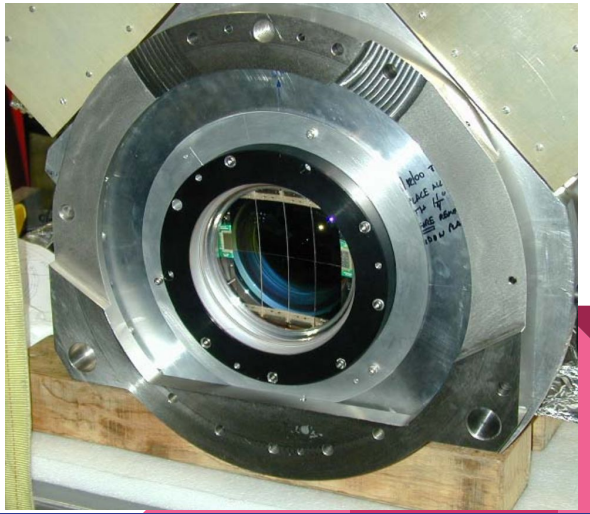
- Carlos Álvarez
- Marc Kassis
- Kyle Lanclos
- Michael Lundquist
- Hector Rodriguez
- John Valliant

The upgrade will increase DEIMOS's sensitivity.



CCD261-84 Scientific Sensor
Back Illuminated, 2048 x 4096 Pixels,
Non Inverted Mode Operation
High-Rho Enhanced Red Sensitivity



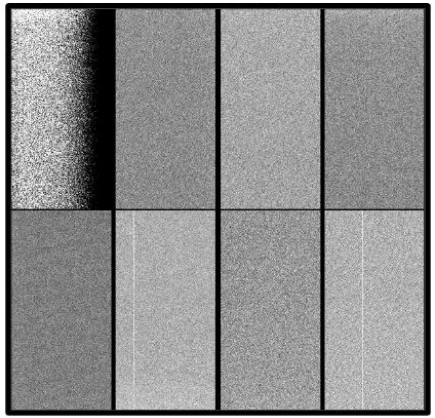


The current DEIMOS detector system is in trouble!

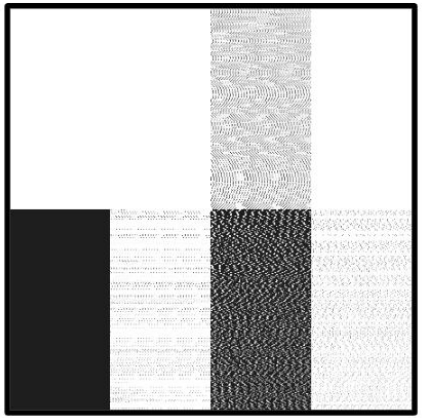
Detectors (see detector issues)

- **Science CCD5 is inoperative.** Spectra taken with CCD5 look like bias frames even when the detector mosaic is exposed to illumination. **Please, note that any target located on CCD1 will have the red part of the spectrum missing.** See matching between the dsimulator diagram and the image plane to design your masks avoiding the affected region.
- **FCS CCD2 is inoperative.** Flexure compensation is still functional using only CCD1, but longer FCS integration times than usual may be required for some spectral configurations to have enough signal on the FCS spectra.

2023-01-06



2023-07-27



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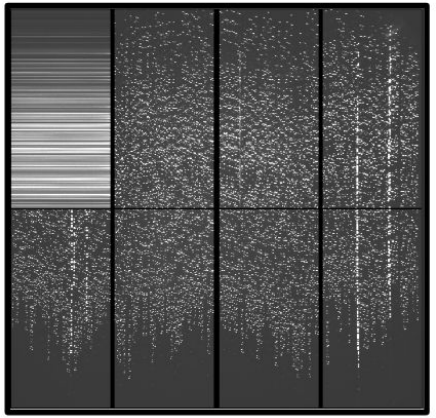
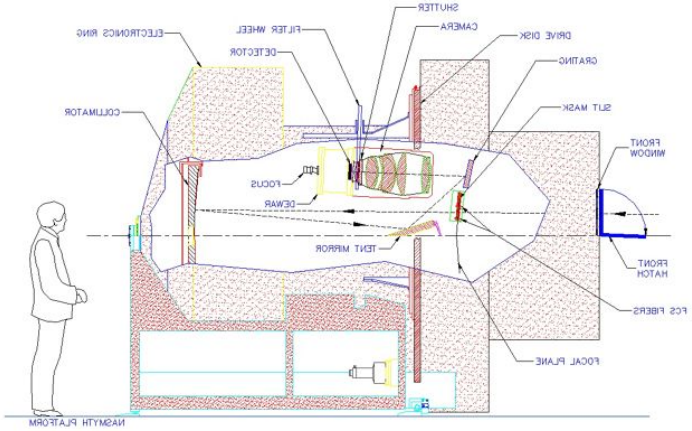
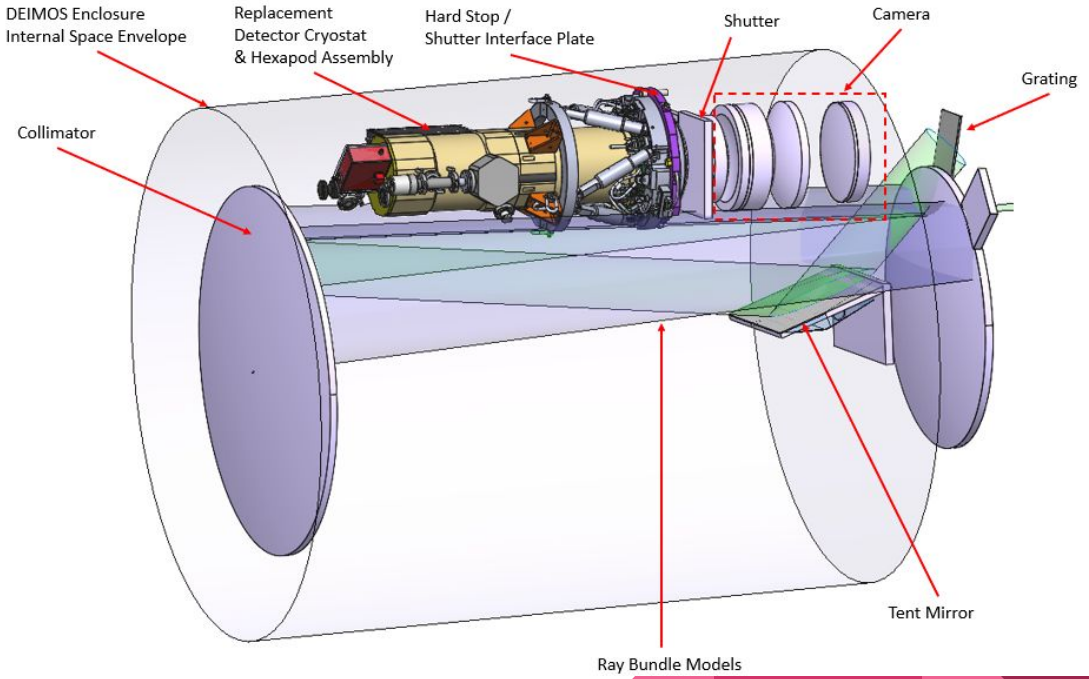
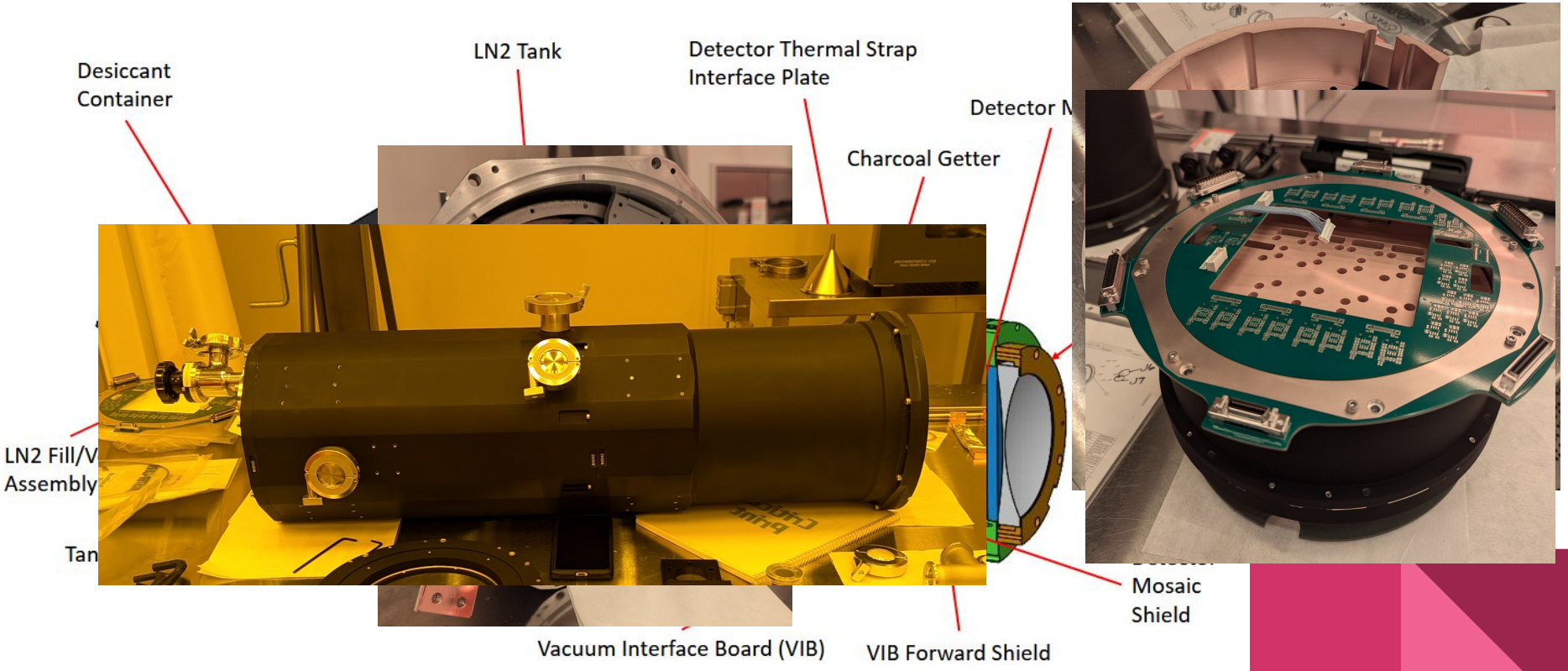


The new detectors will be in a new cryostat.

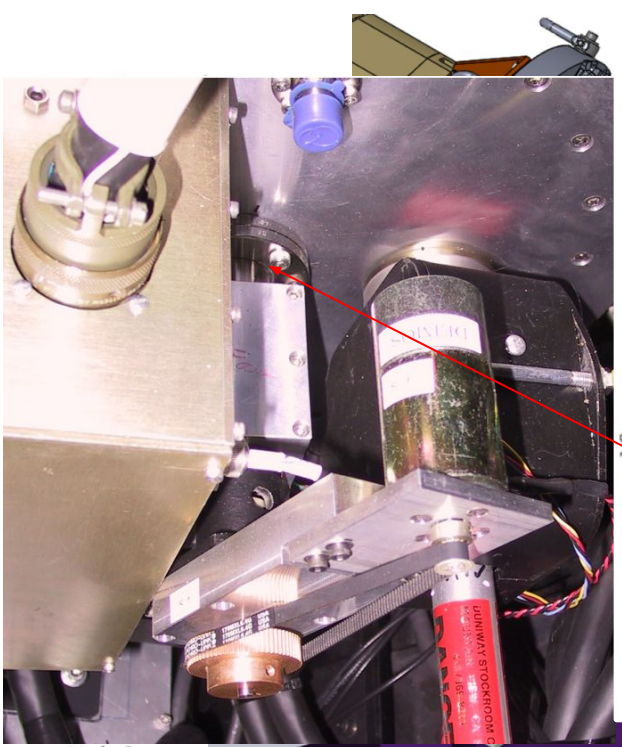




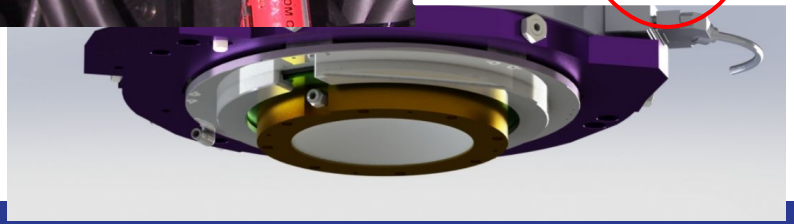
Cryostat assembly (w/o detectors) is nearly complete.

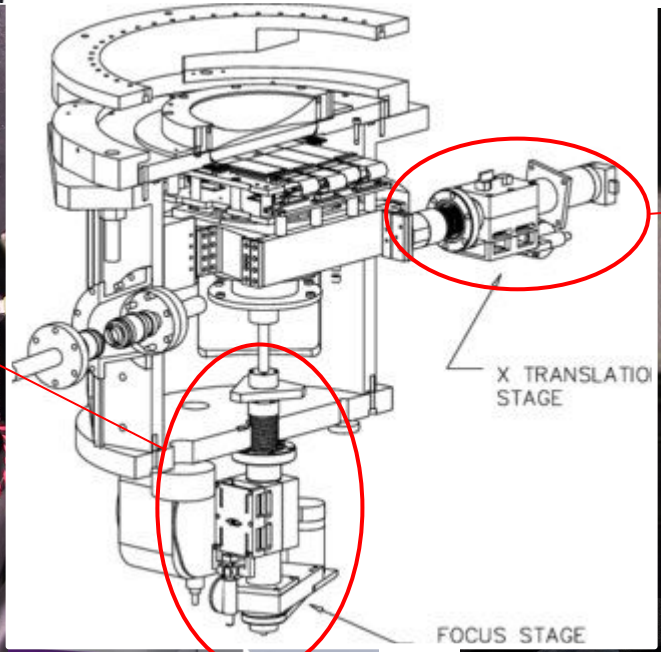


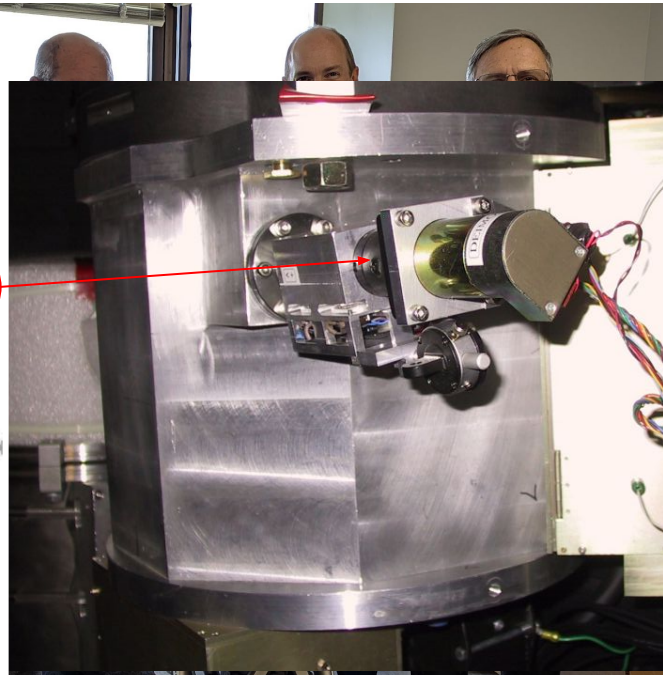
A hexapod will provide focus and flexure compensation.

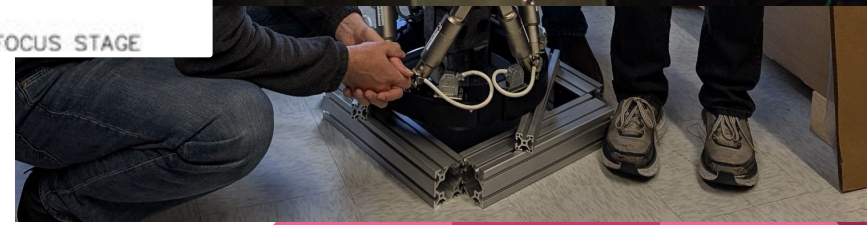


Hub &
Connector

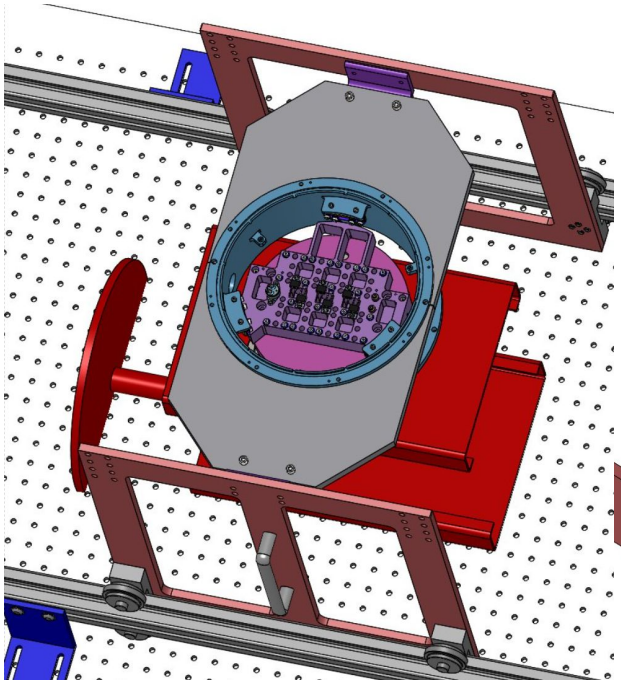


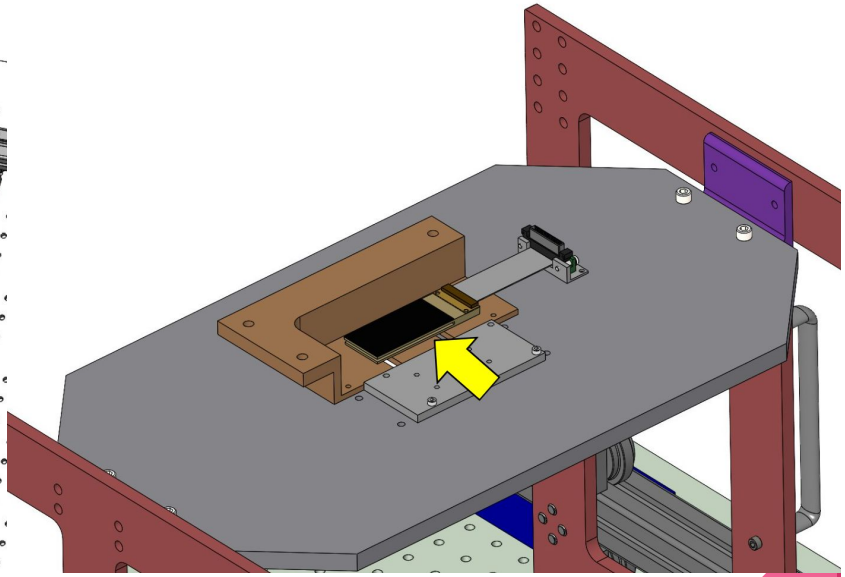


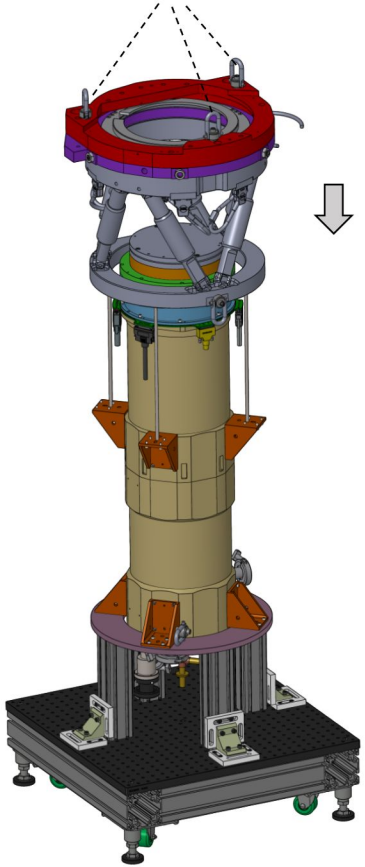




The cryostat will soon arrive at Caltech, where the detectors will be installed







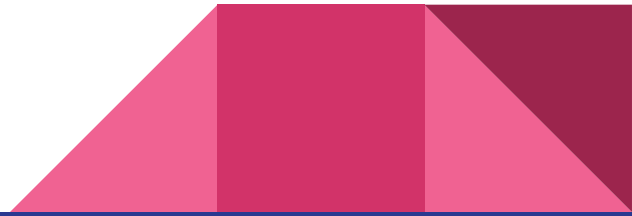
Upgraded DEIMOS will be commissioned in 2025A.

take out old stuff

put in new stuff

Schedule

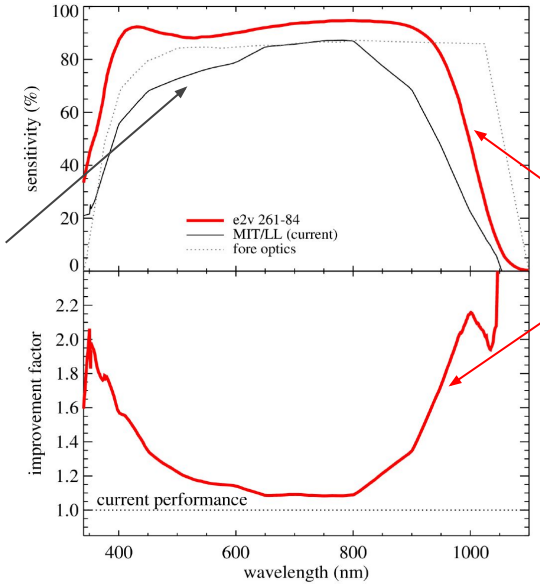
- Oct 2024: pre-pre-ship review from Notre Dame to Caltech
- Fall 2024: electronics integration at Caltech
- March 2025: pre-ship review
- April 2025: installation and commissioning at observatory
- June 2025: new DEIMOS ready for science



Take-away message

By the end of 2025A, you will have an improved DEIMOS! You can use this for your proposals:

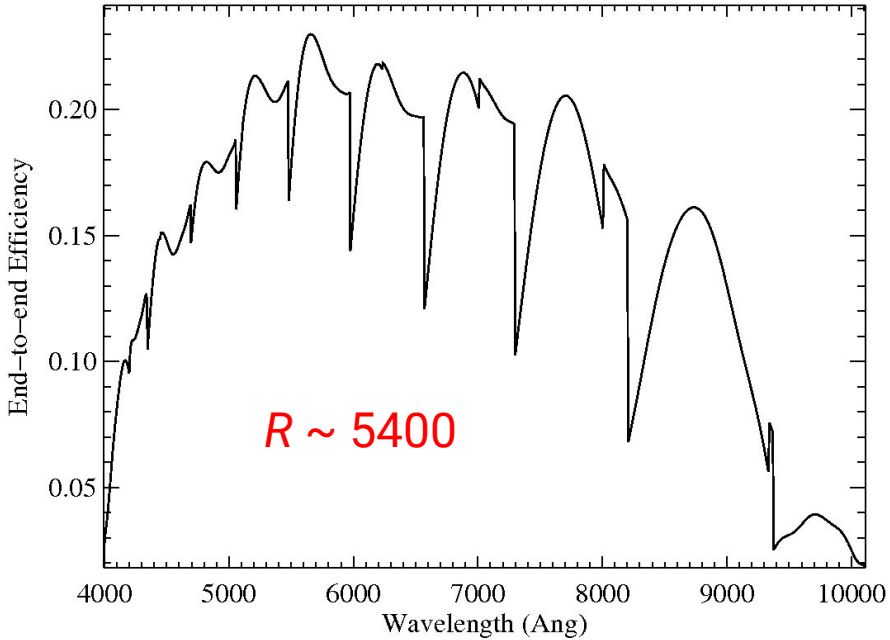
before
April 2025



after
June 2025

ESI vs. DEIMOS

ESI echellette



DEIMOS