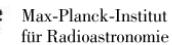




Observing Procedures in Transition

Judit Sturmann





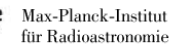
On the Road

Full AO: WFS and DM at telescopes
Slow WFS and small DM in the lab

WFS at telescopes as tip/tilt detector
Slow WFS and small DM in the lab

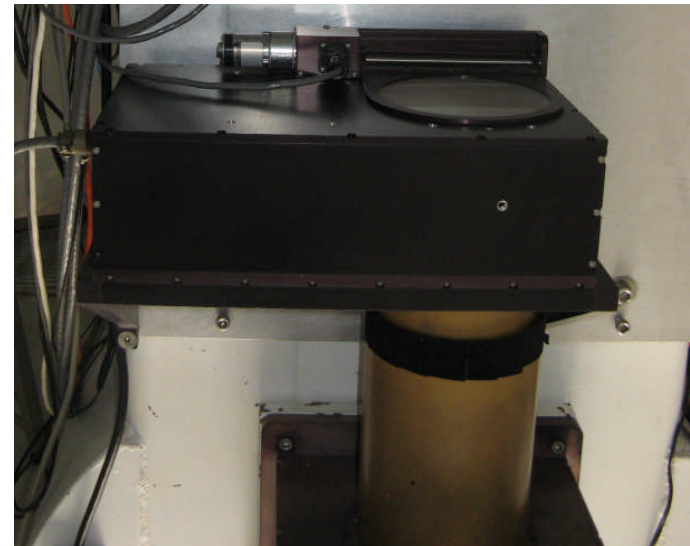
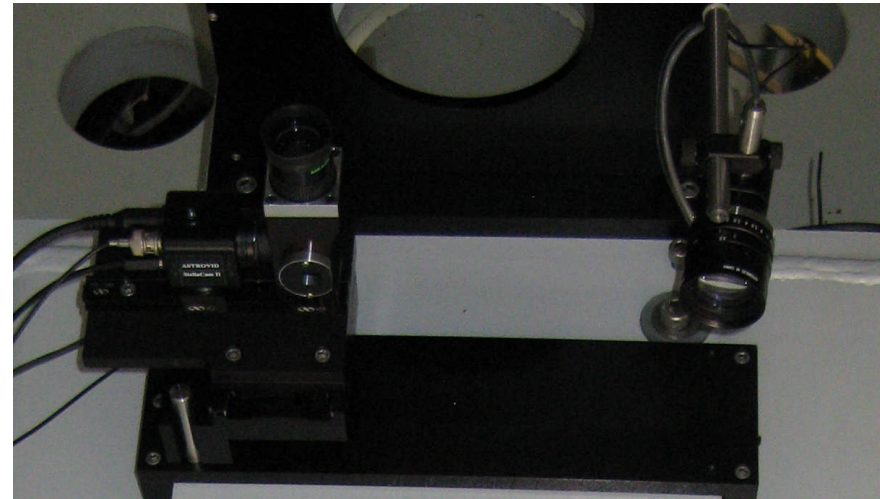
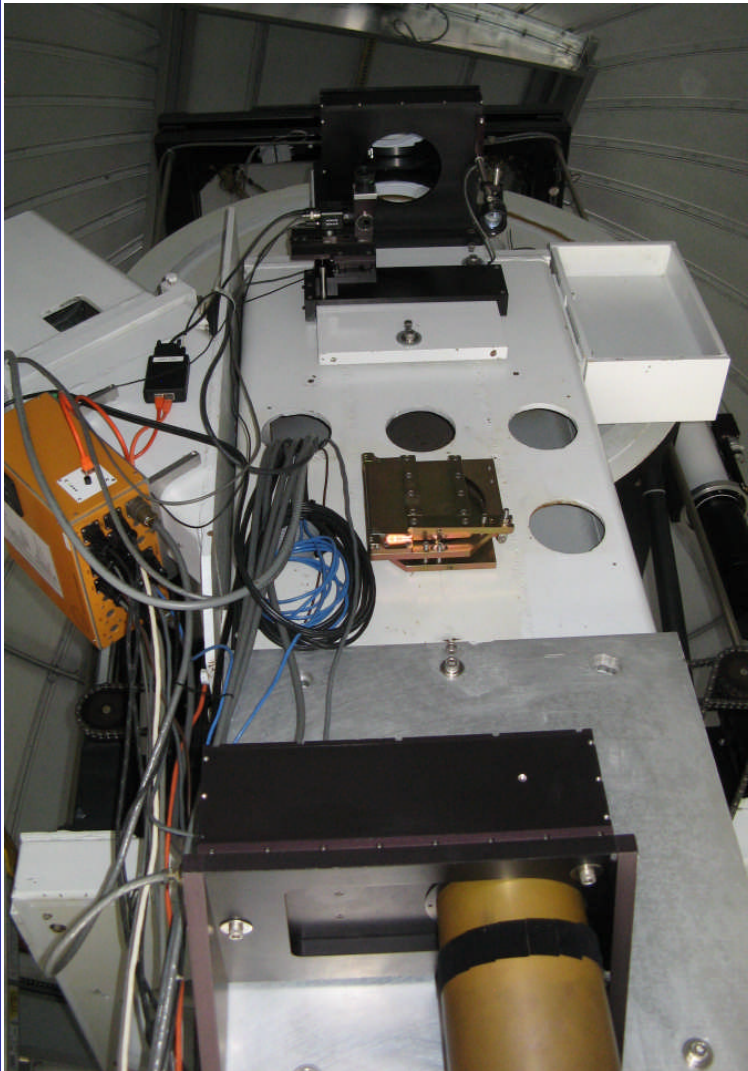
WFS at telescopes as tip/tilt detector

**Acquisition using AO dichroics,
old tip/tilt detector in the lab**



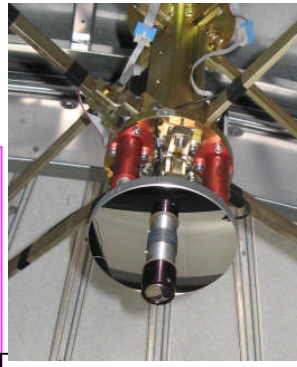
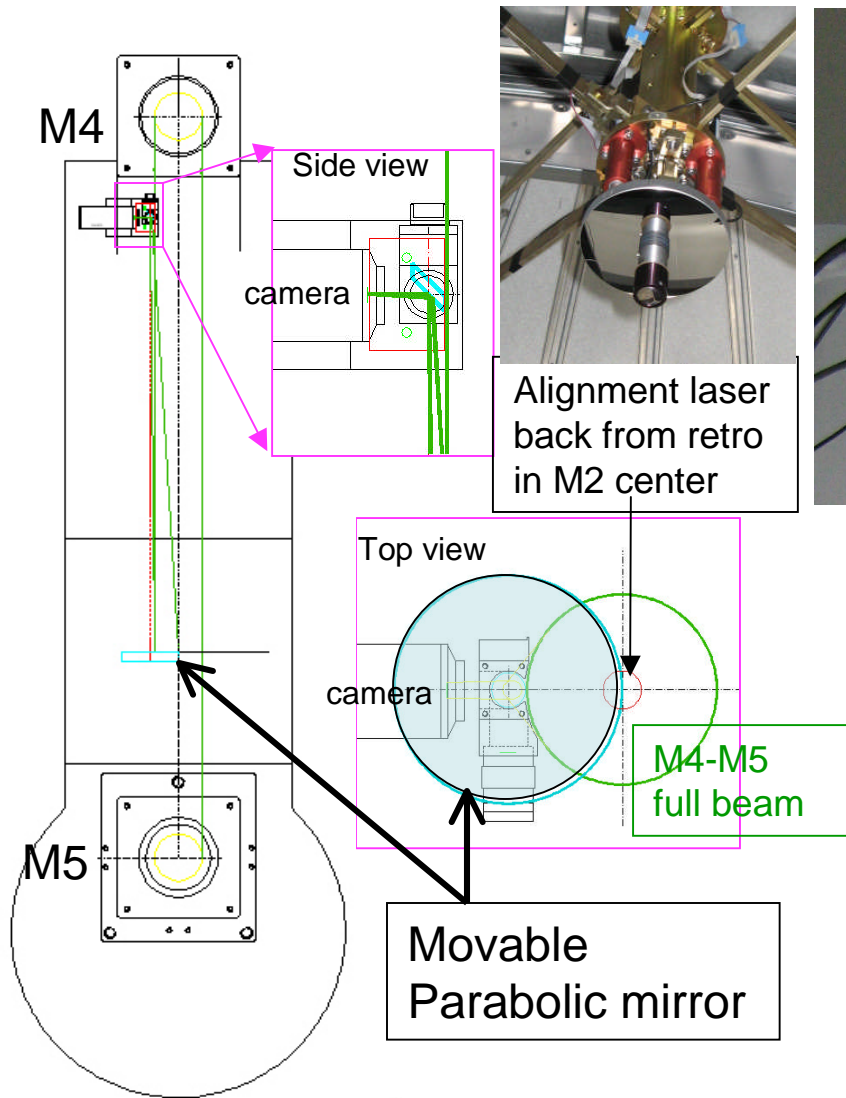


Old Acquisition on Telescopes

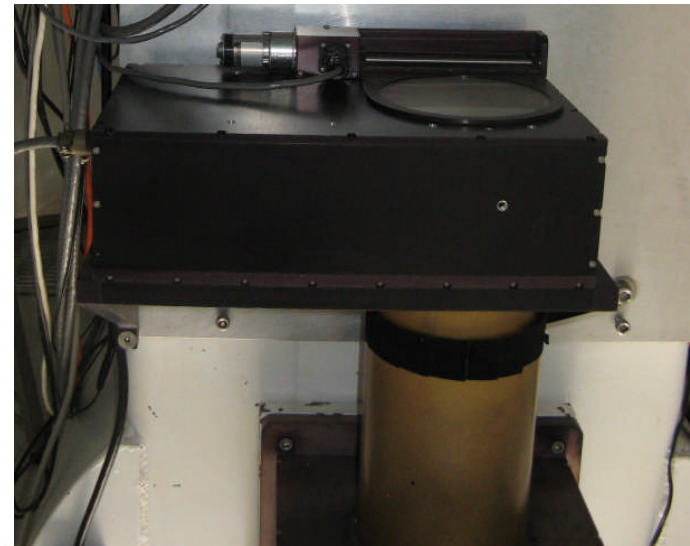
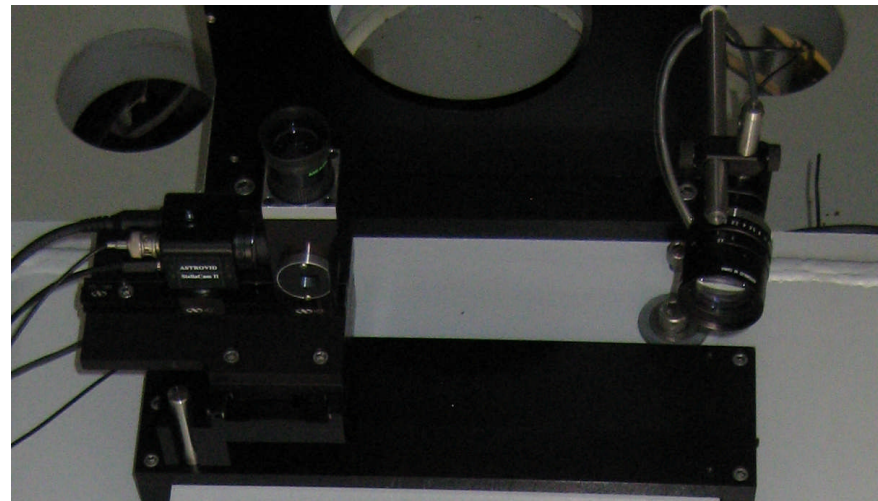




Old Acquisition Optical Path



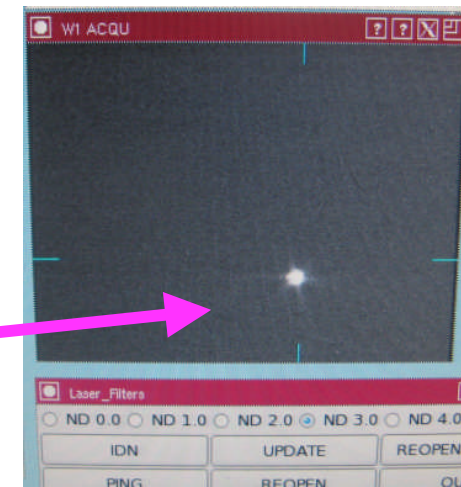
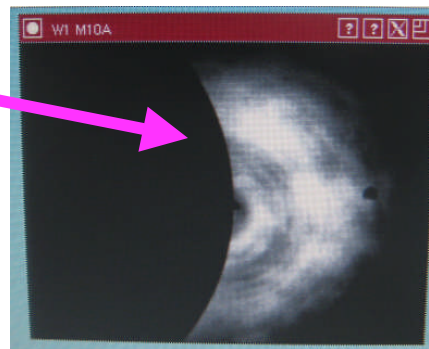
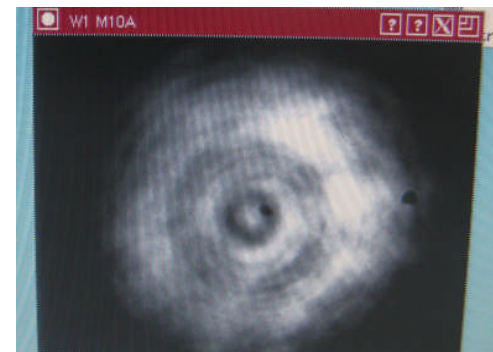
Alignment laser back from retro in M2 center





Acquisition Using Old Setup

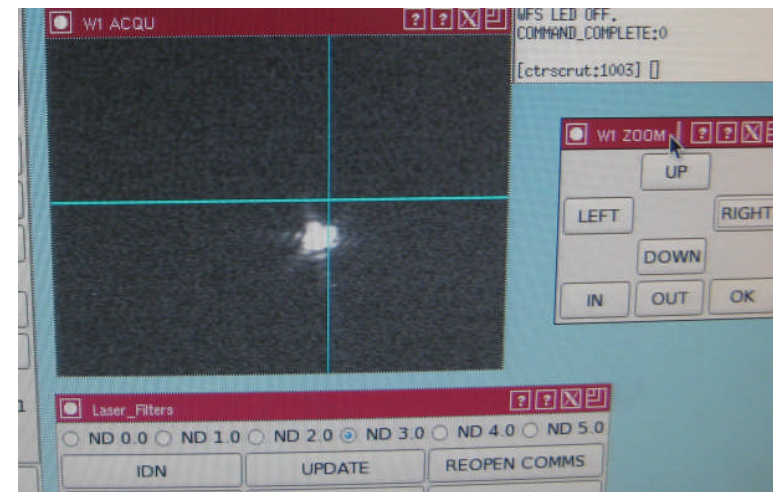
- The green alignment laser was aligned in the lab before the observing night started
- M10 mirror adjusted to minimize beam shear could be repeated during the night if necessary
- Acquisition mirror IN
- M5 cover open, M3 cover open to see the alignment laser in acquisition camera





Acquisition Using Old Setup

- Adjust tracking ticks to alignment laser

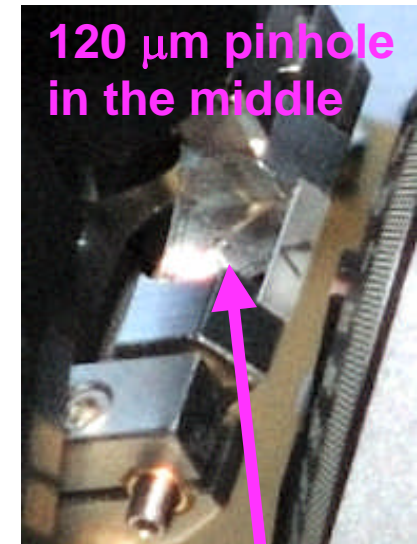
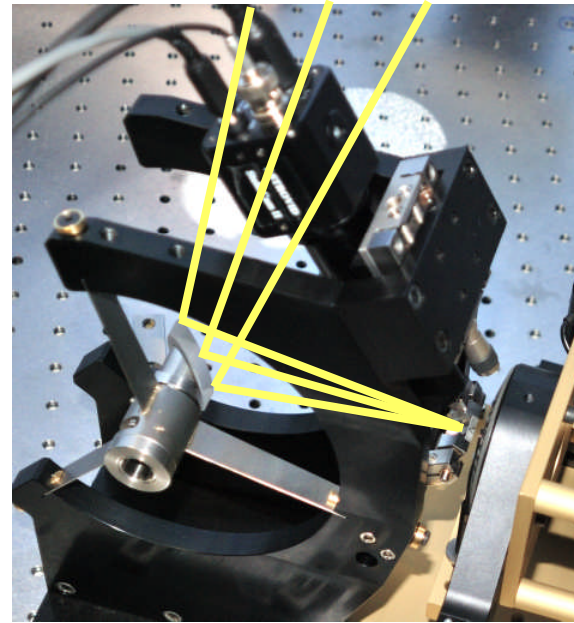
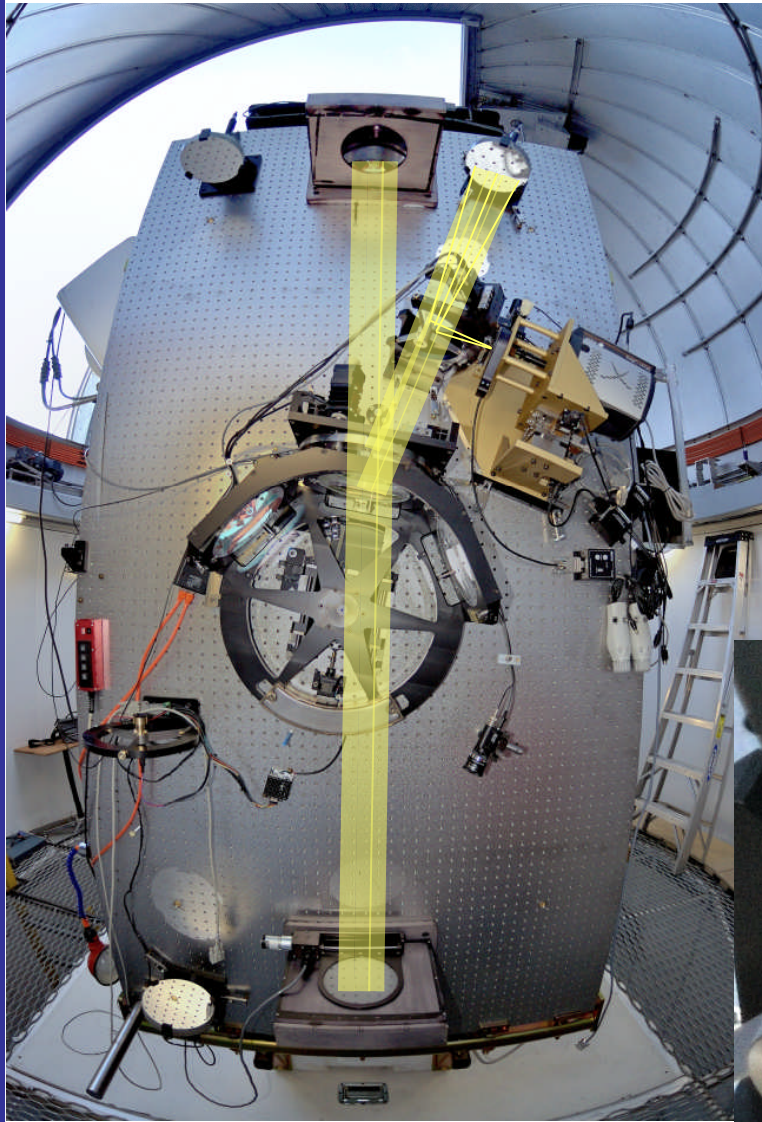


- “GRAB” function will adjust telescope pointing to place the star to the ticks
- Tip/tilt detector in the lab sees the star and tip/tiltservo takes over

The laser spot has to be checked and ticks adjusted periodically depending on the accuracy of the Coude-alignment.

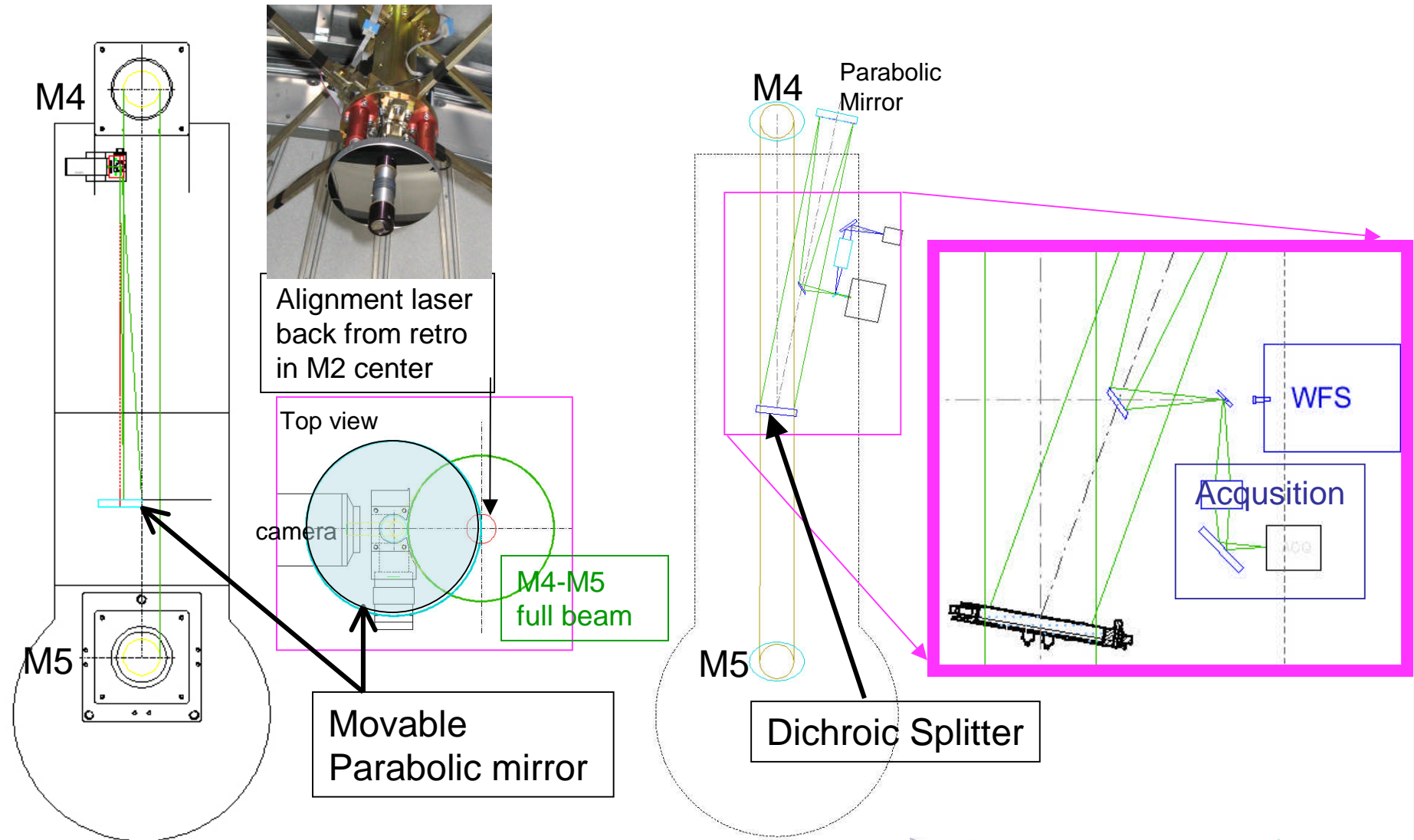


New Acquisition on Telescopes



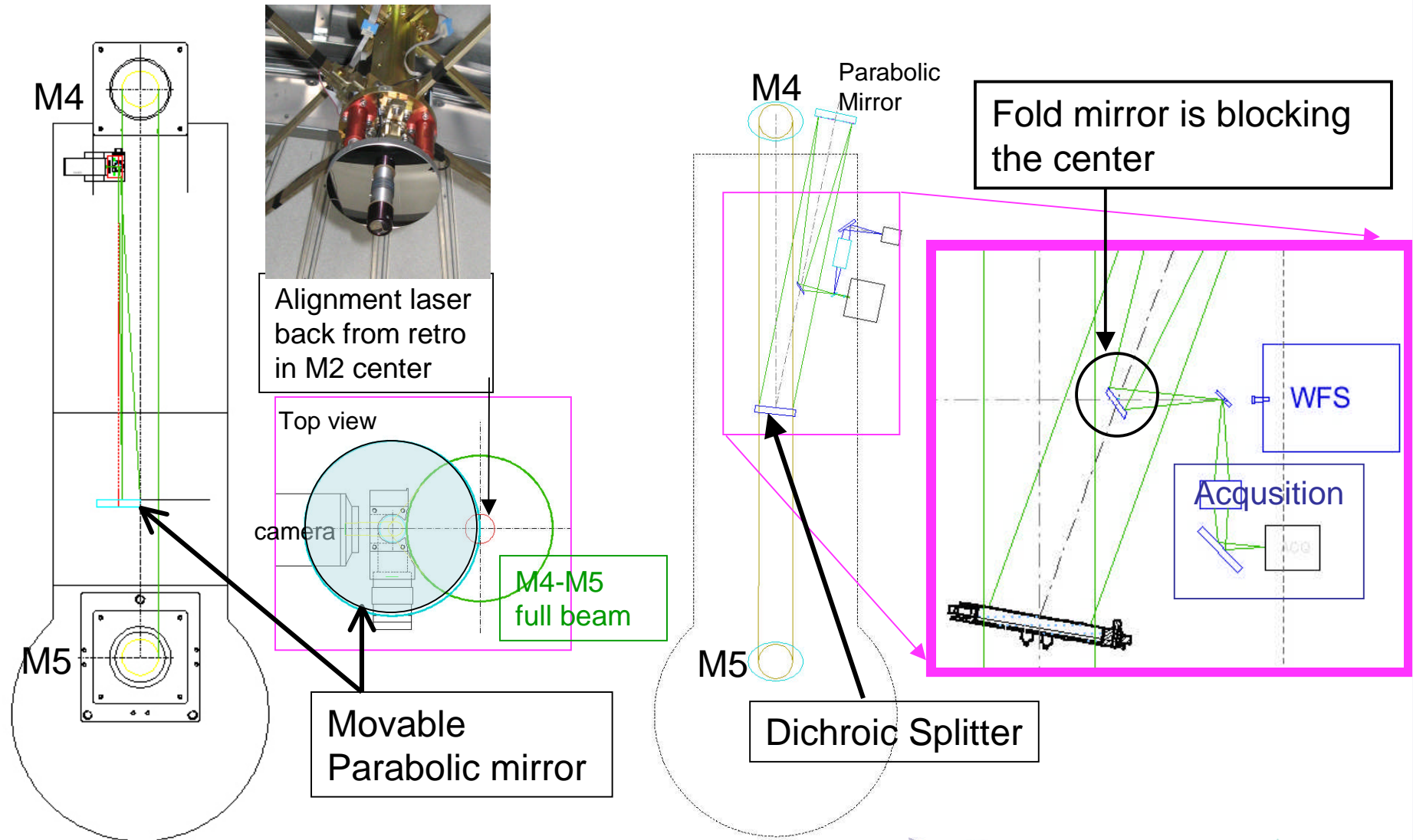


Old and New Acquisition Optical Paths



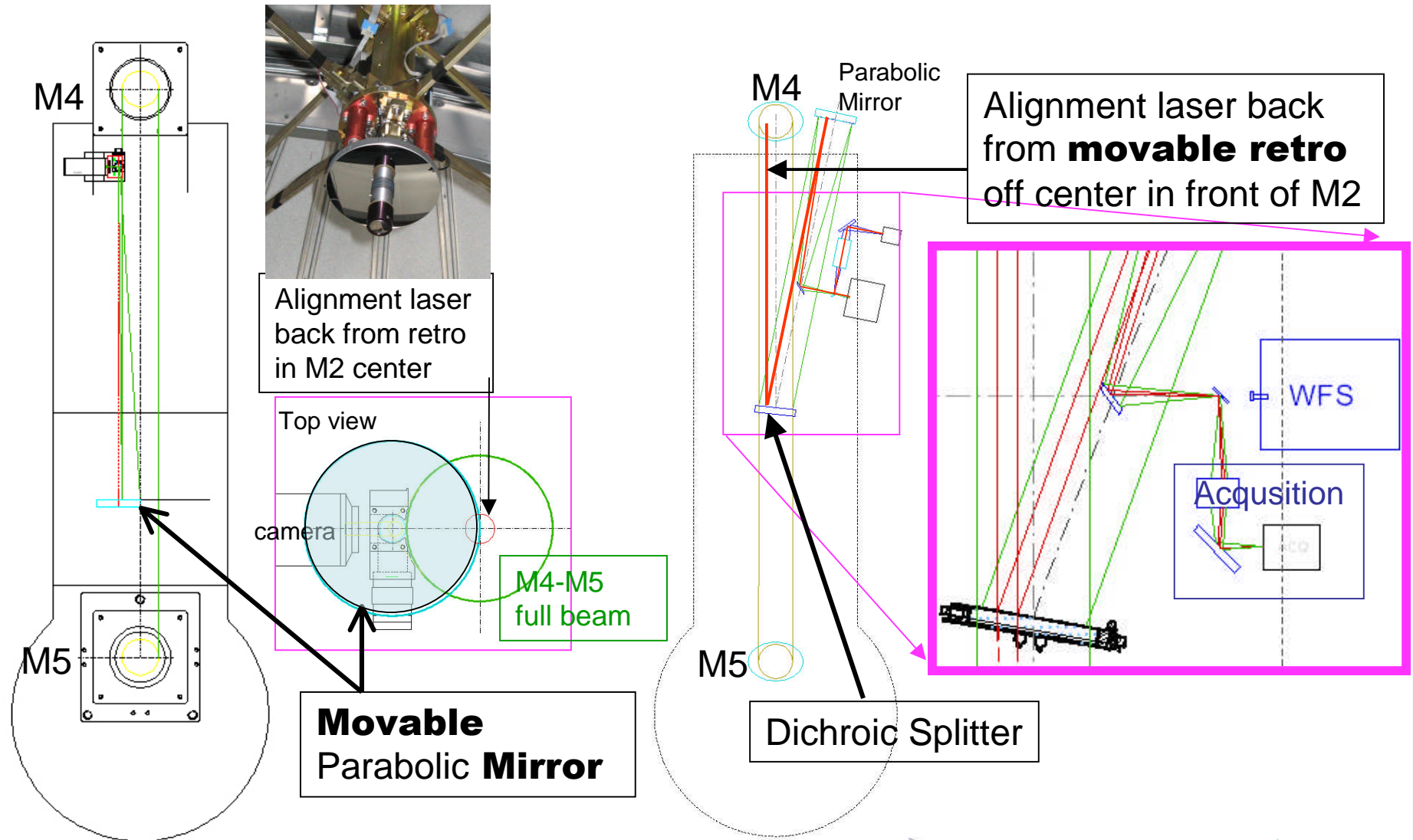


Old and New Acquisition Optical Paths



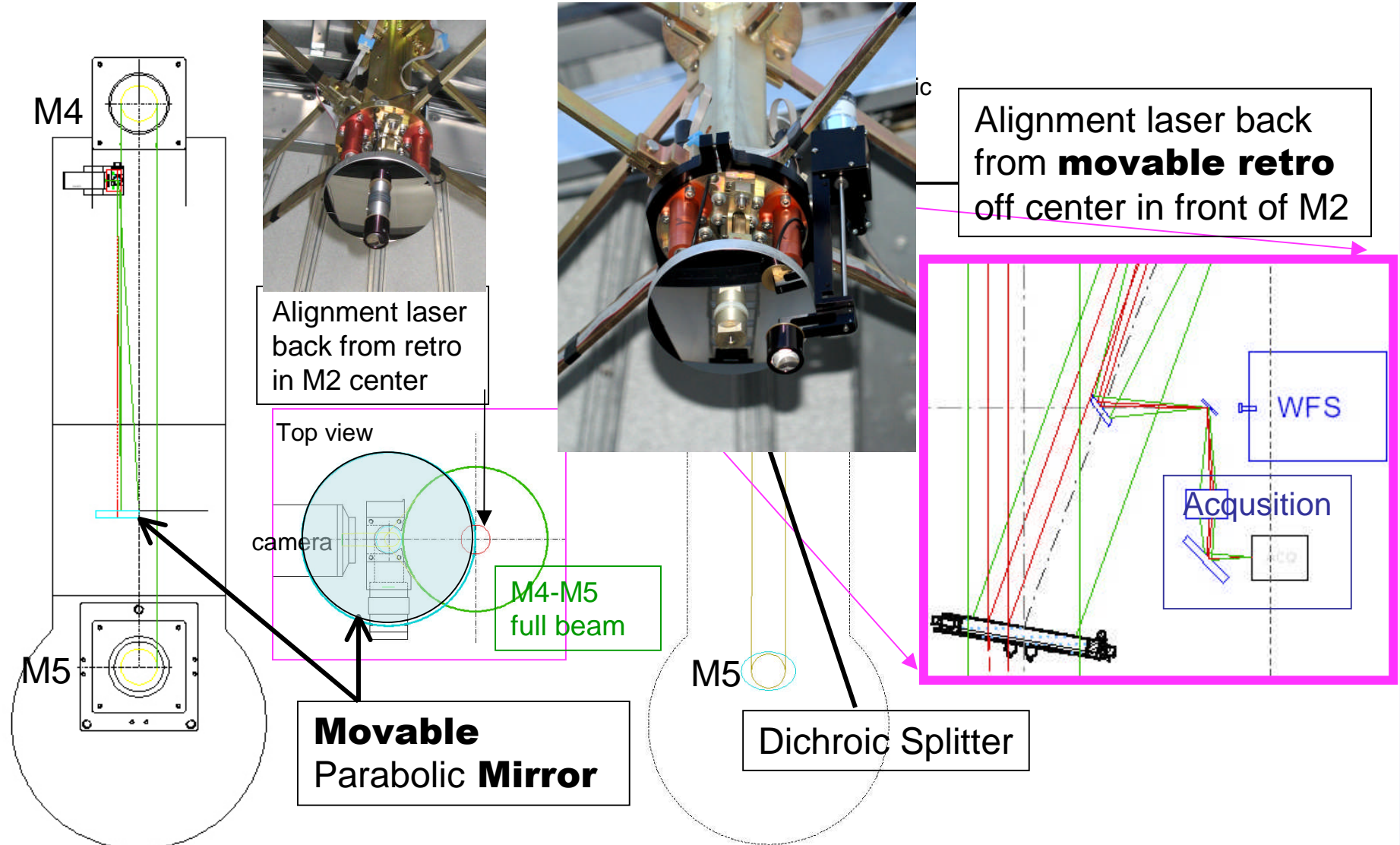


Old and New Acquisition Optical Paths





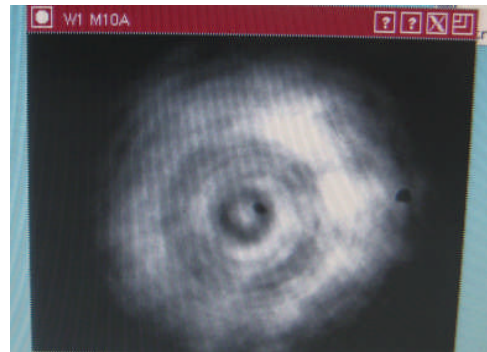
Old and New Acquisition Optical Paths



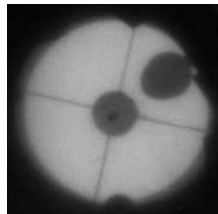


Acquisition Using New Setup Pg.1.

- The green alignment laser was aligned in the lab before the observing night started
- M10 mirror adjusted to minimize beam shear could be repeated during the night if necessary

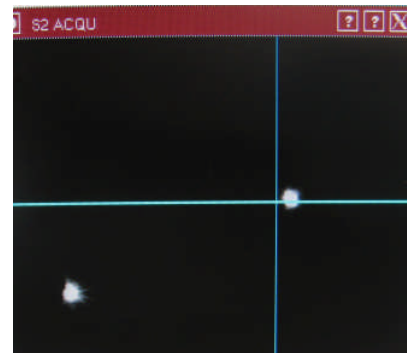


- Corner cube IN



- M5 cover open, M3 cover open to see the alignment laser in acquisition camera

Acquisition TV zoomed in view at night time



Acquisition TV zoomed out view daytime

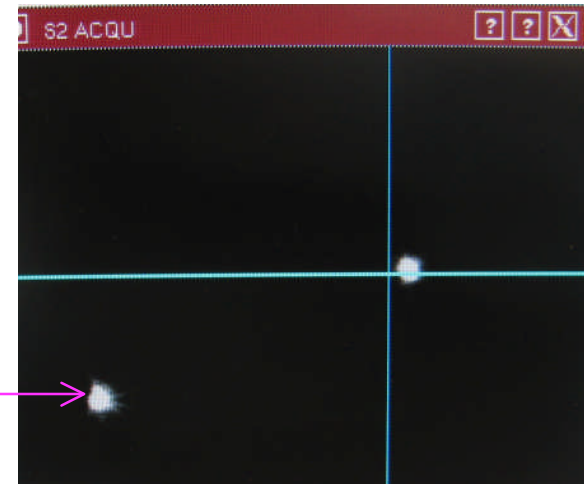




Acquisition Using New Setup Pg.2.

- Adjust tracking ticks to alignment laser.
The position of the laser spot with respect to the hole in the mirror is not critical when NOT using the WFS at the telescope.

The edge of the 120 μm pinhole



- Use “GET” function and select the respective star image, “GET” will adjust telescope pointing to place the star to the ticks
- Tip/tilt detector in the lab sees the star and tip/tiltservo takes over

The laser spot has to be checked and ticks adjusted periodically depending on the accuracy of the Coude-alignment.

This procedure was tested and will be used as the new acquisition setup will be installed on all telescopes this year.

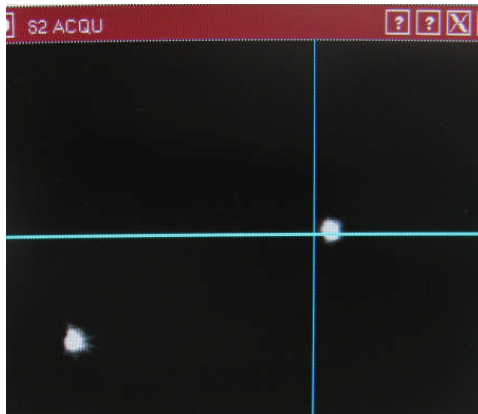


Dichroic Splitters – 3 Types

1. Bare substrate

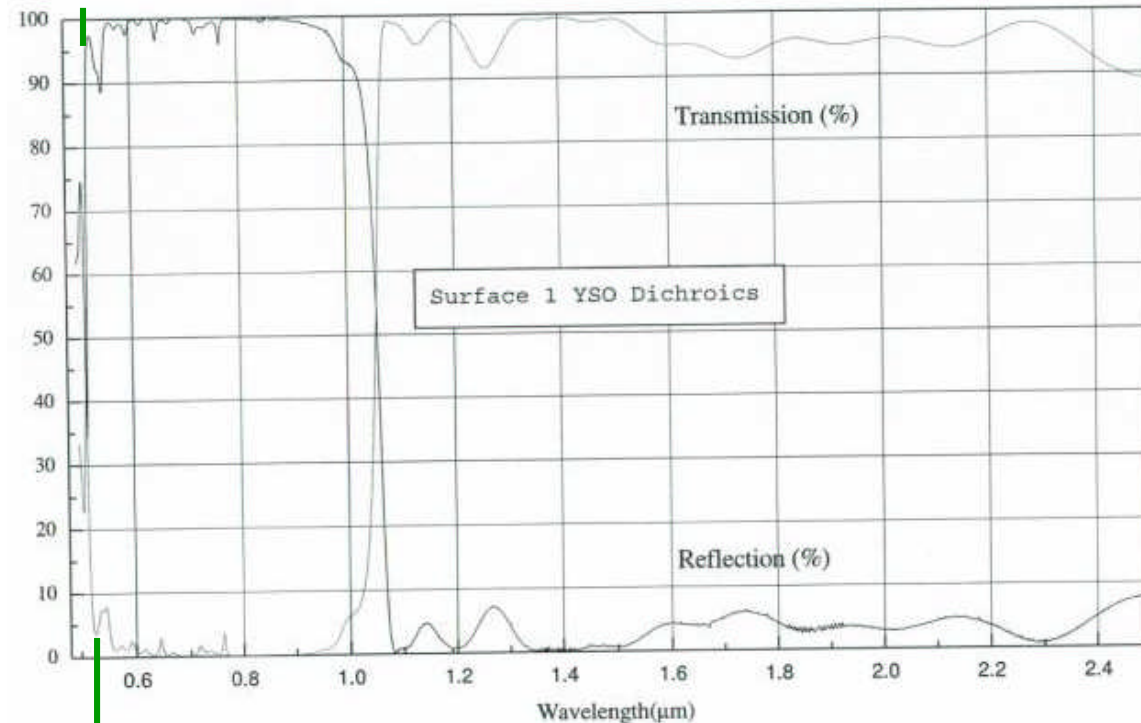
About 4 % reflection from both surfaces

Alignment laser as seen in acquisition camera



About 92% transmitted toward the lab

2. For beam combiners in the infrared and also for Young Stellar Objects → YSO

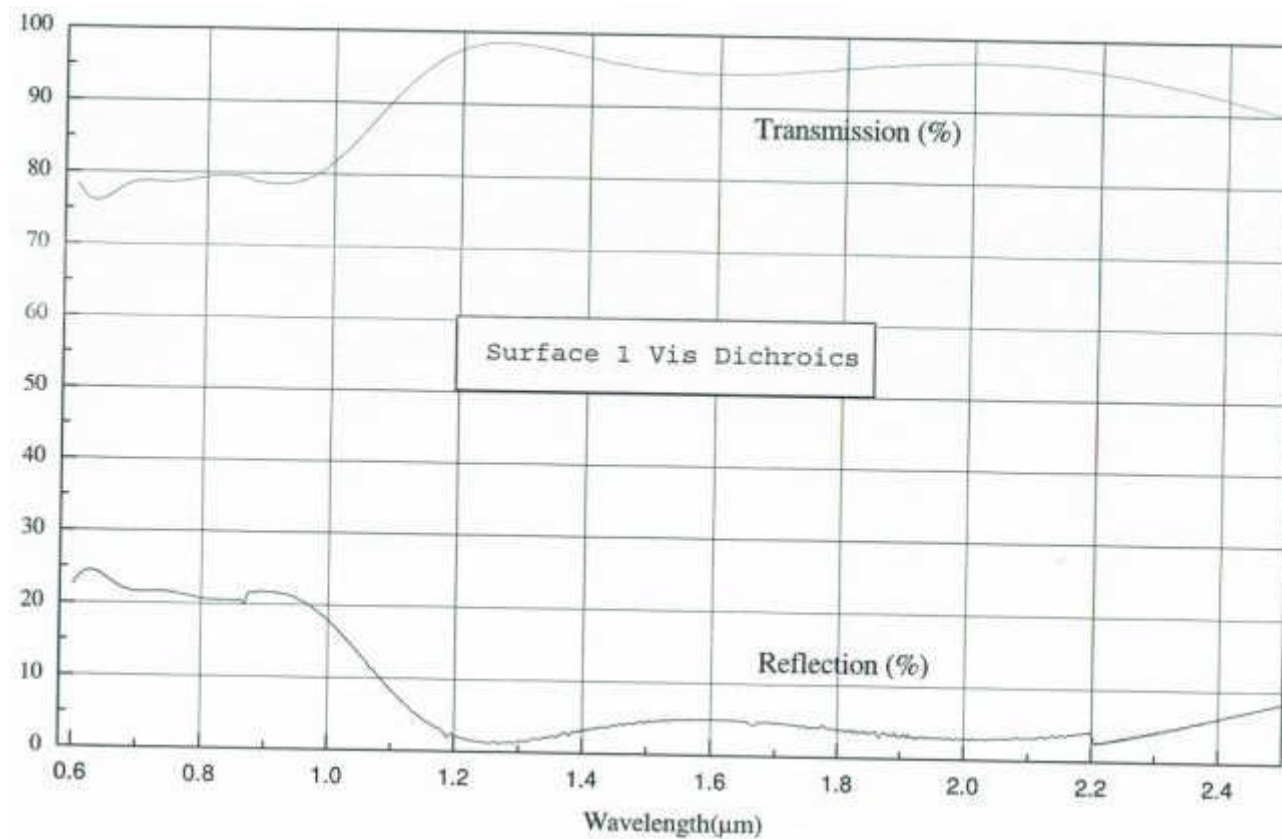


Alignment laser 532 nm



Dichroic Splitters – 3 Types

3. For beam combiners in the visible \rightarrow VIS





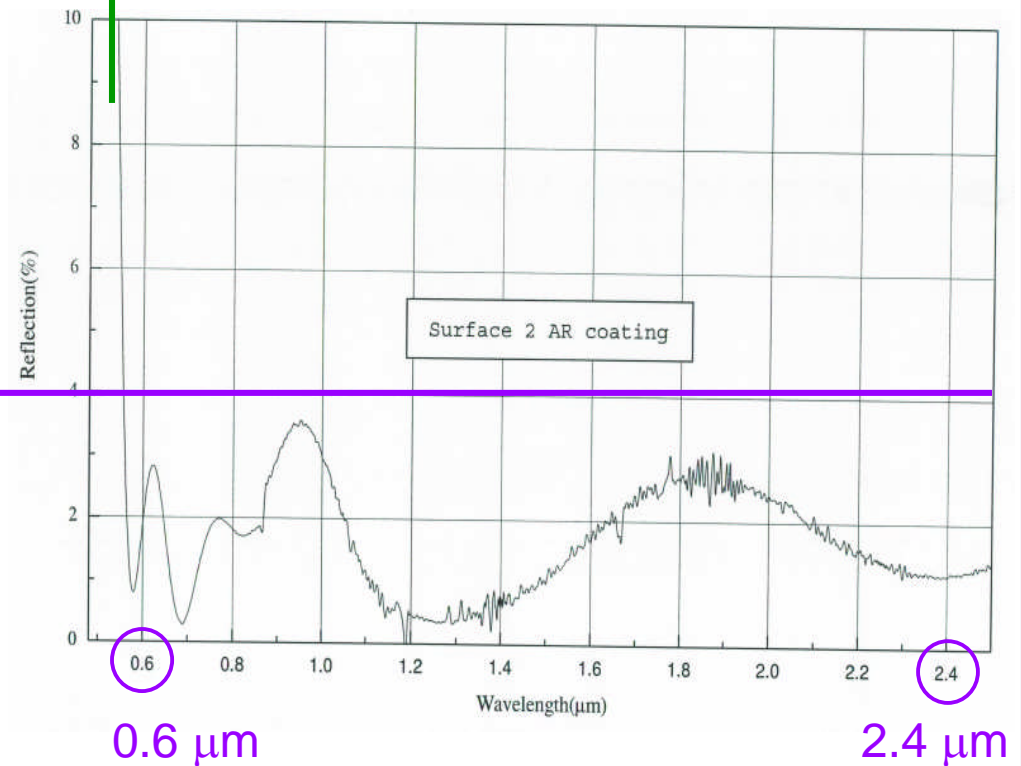
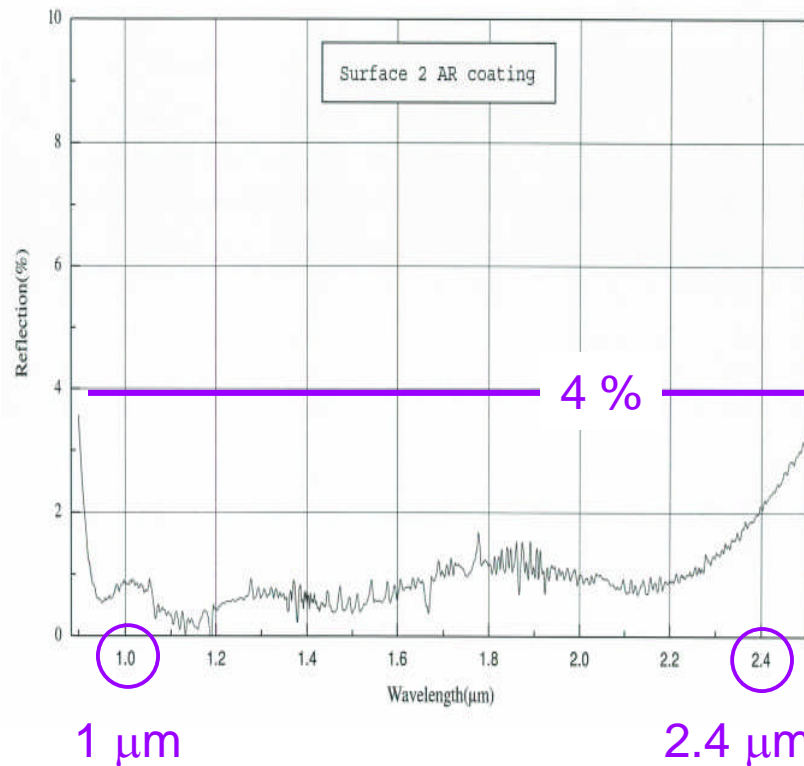
Dichroic Splitters – 3 Types

Antireflection coatings on 2nd surfaces

2. YSO

Alignment laser 532 nm

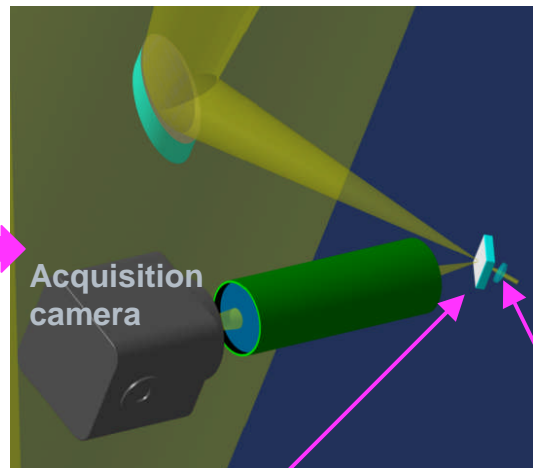
3. VIS



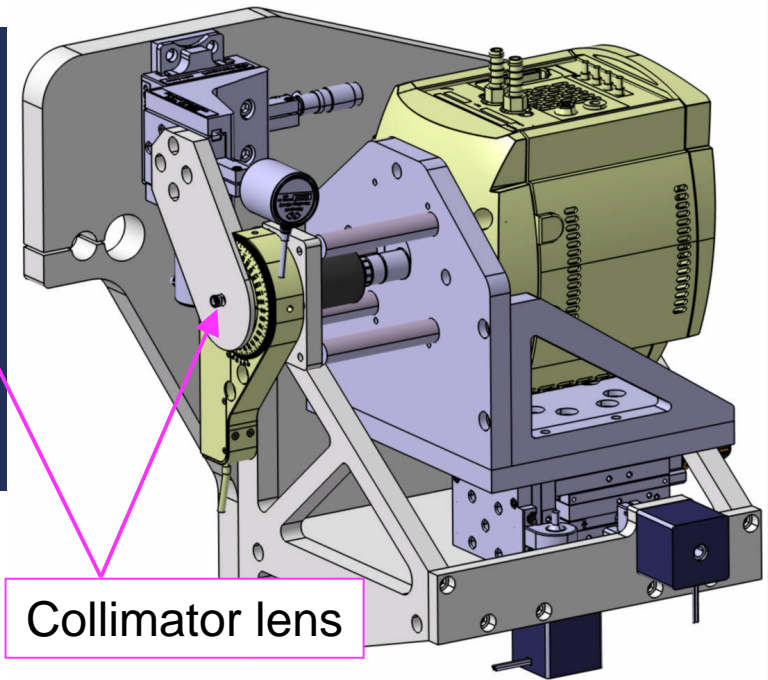


In experimental phase: Using WFS for Tip -Tilt Sensing

WFS behind the pinhole



Mirror with a pinhole (120 μm)

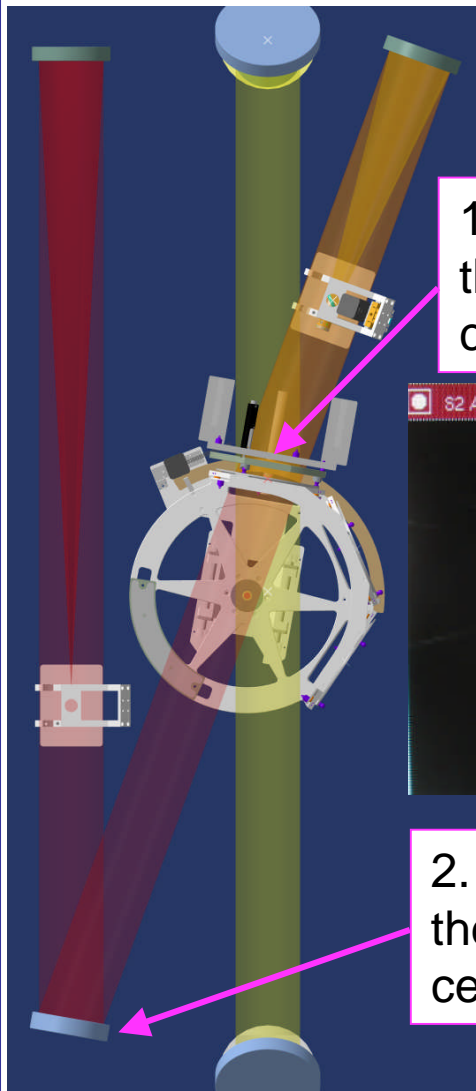


Collimator lens

The Beacon: Collimated red or blue beam on the same path as the green alignment laser from the lab or the star

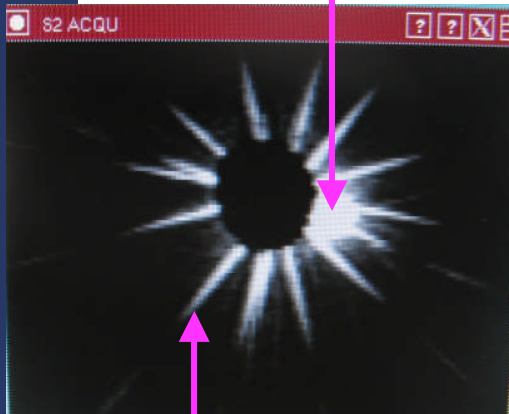


Getting Through the Pinhole



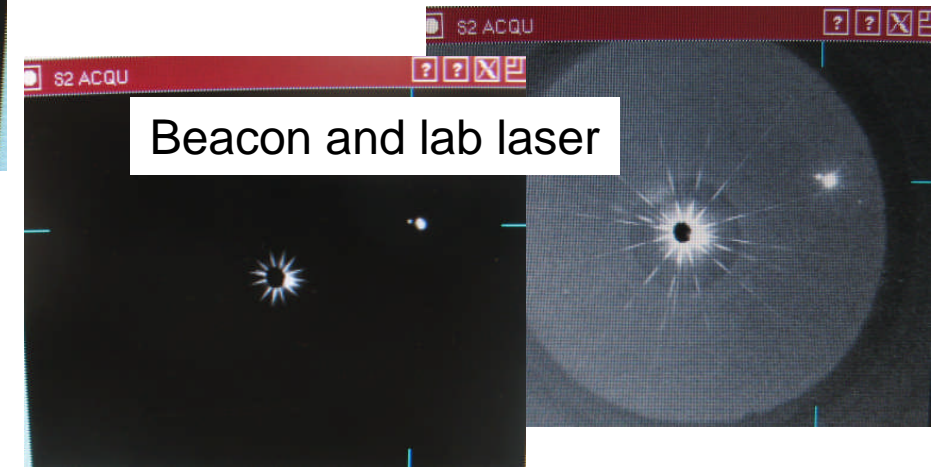
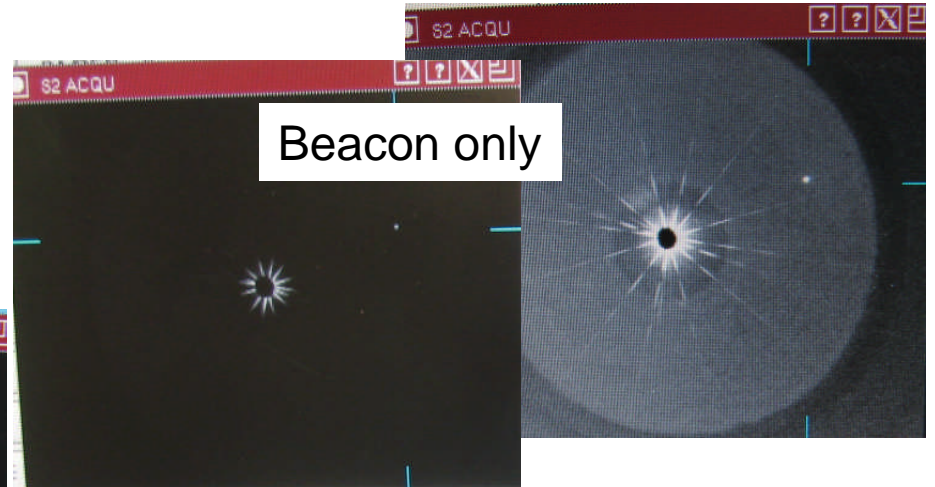
Adjustments available to be part of future procedure:

1. Adjust remotely the beam splitter to center the laser



2. Adjust remotely the fold mirror to center the beacon

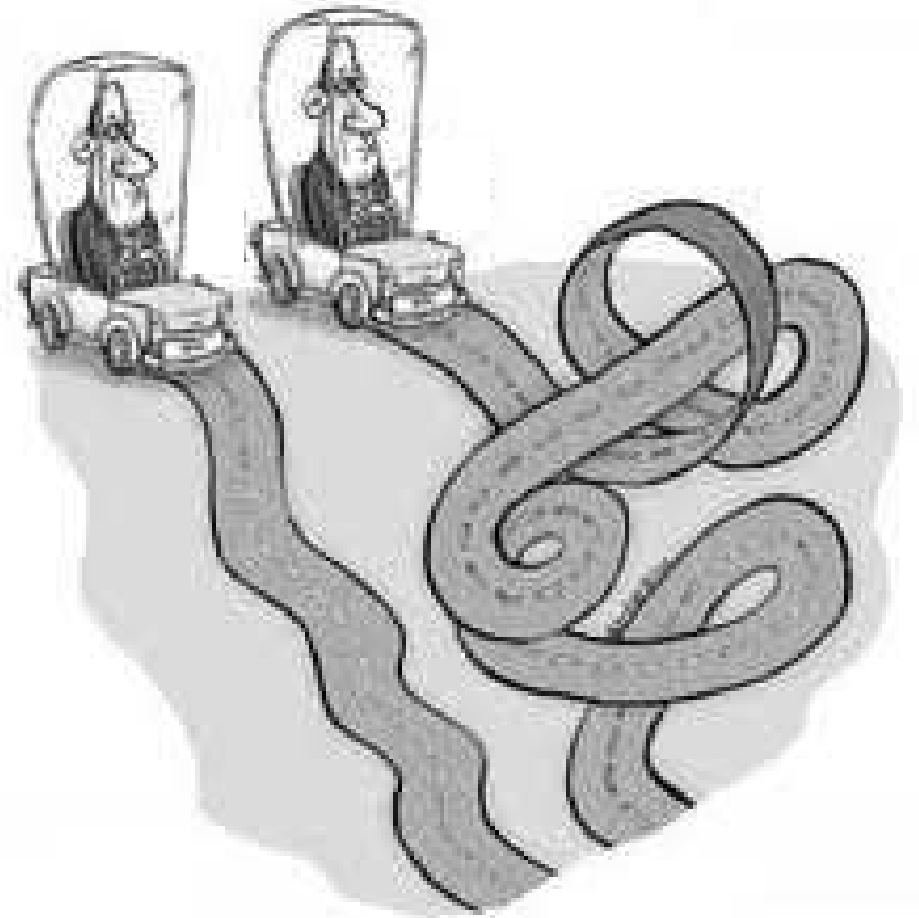
Images on Acquisition TV





The Road Ahead

... could be tricky ...





Hoping for a Smooth Ride

Full AO: WFS and DM at telescopes
Slow WFS and small DM in the lab

WFS at telescopes as tip/tilt detector
Slow WFS and small DM in the lab

WFS at telescopes as tip/tilt detector

Acquisition using AO dichroics,
old tip/tilt detector in the lab

