AO188/LGS status

AO188 development group(Subaru Telescope, NAOJ)

Tasks for development team in 2009.

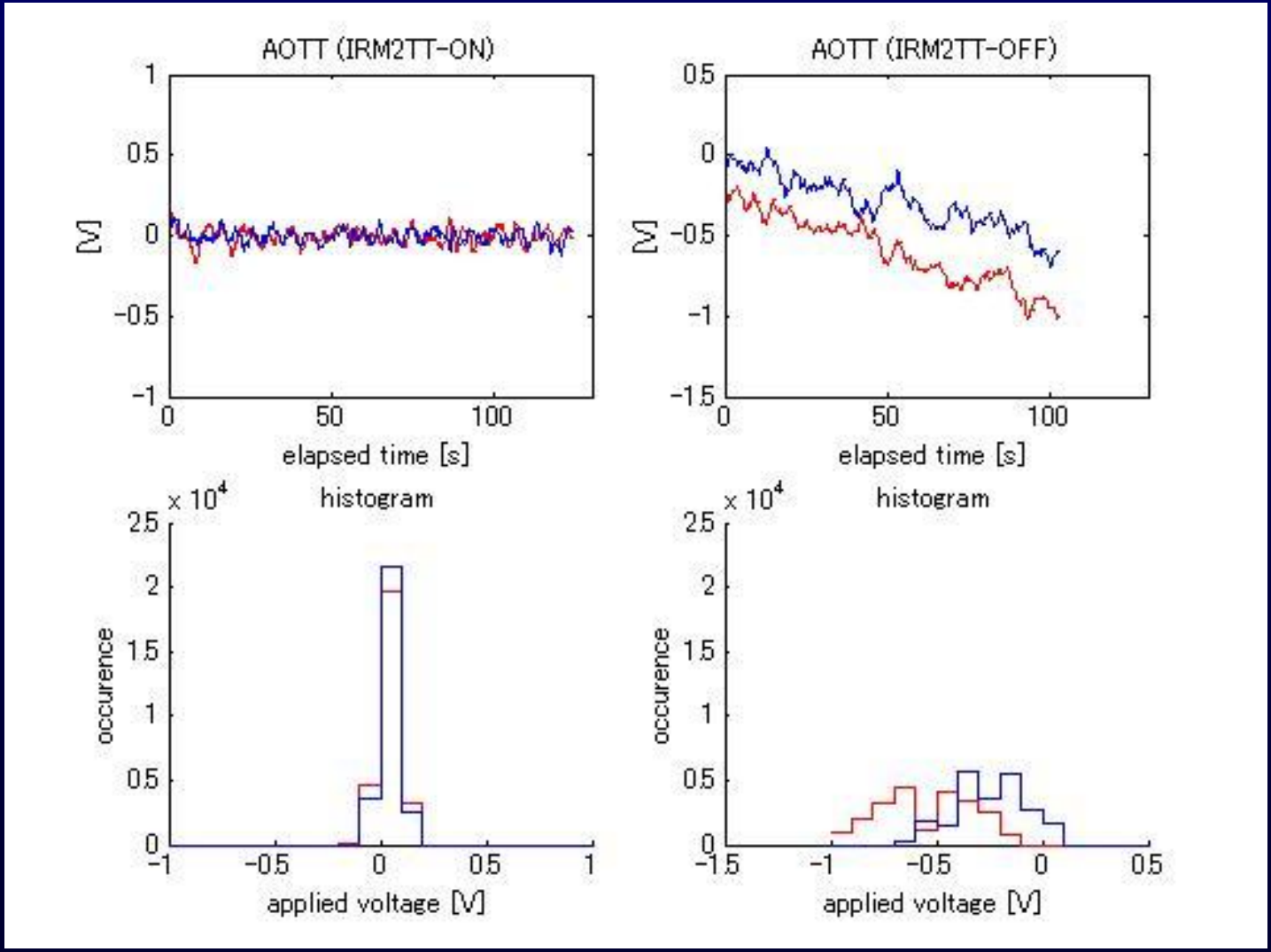
- Minor upgrade of NGS mode.
  - Thermal background pattern.
  - Performance evaluation.
  - System characterization.
- LGS mode implementation.
  - LOWFS, BS exchange system, GS acquisition unit for LOWFS.
- New instruments.
  - HiCIAO(SEEDS), SCExAO, NH3 gas cell, Kyoto3D, etc.

Thermal backgrond pattern

- Dust on the mirrors of AOIMR, which is near from the focal plane, causes the ring pattern.
- When the angle of the tip-tilt mount at the DM holder changes, the pattern will move.
- The pattern will remain, even if we subtracted by the dithered images.

- The offset angle on the tip-tilt mount of AO are offloaded to the telescope secondary.
- Dust cleaning. Prevent from dust accumulation on the mirrors.

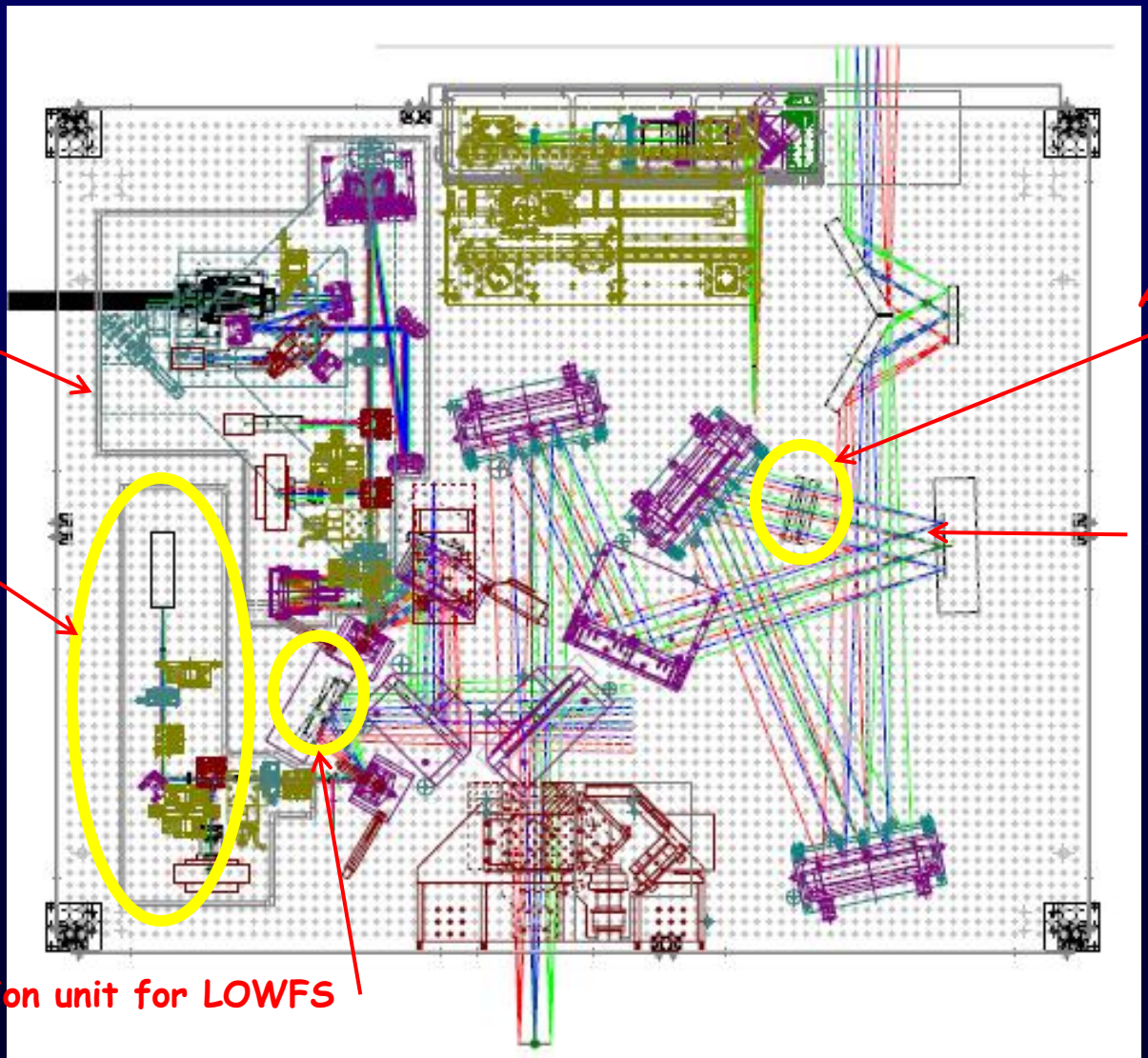
Thermal backgrond pattern



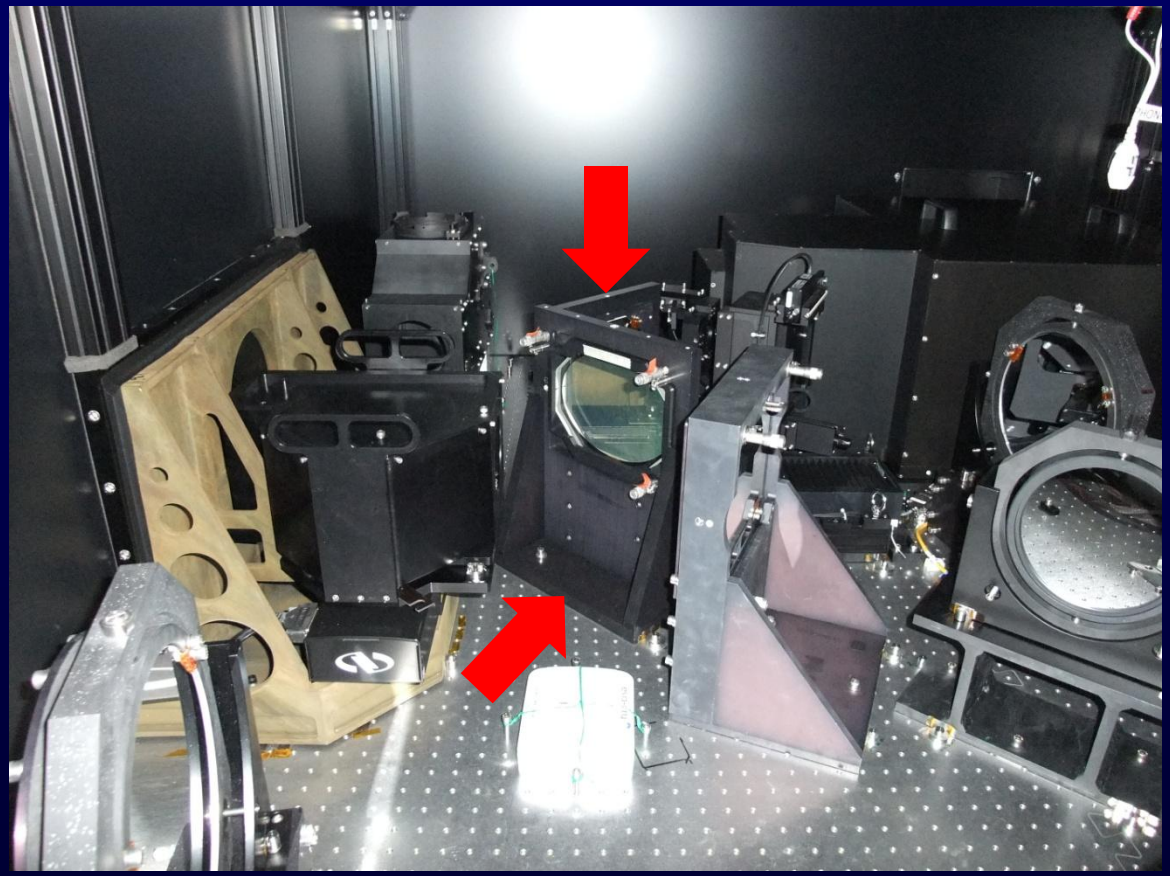
LGS mode

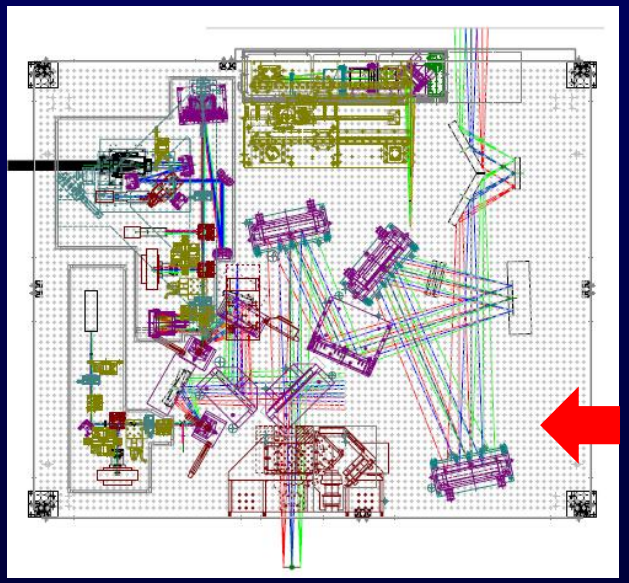
- High order wavefront error is measured by the laser guide star (LGS).
- Tip-tilt and focus error is measured by the natural guide star.

AO188 optics

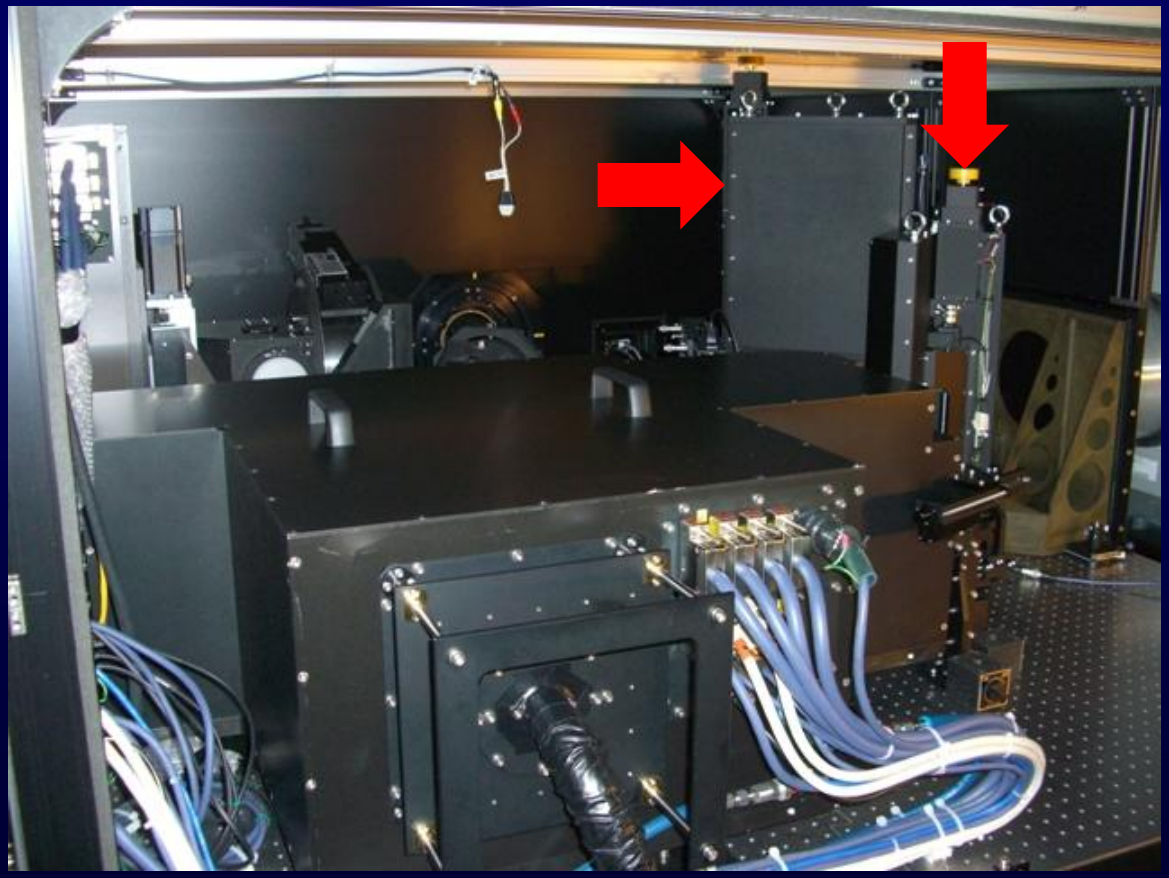


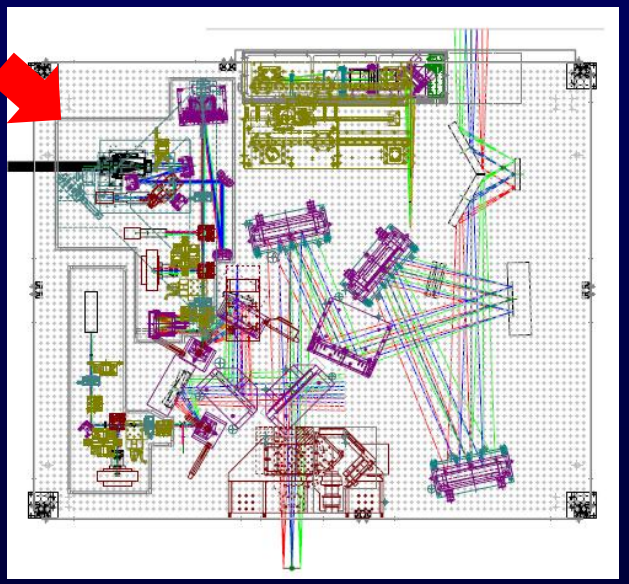
Beam splitter in temporary mount



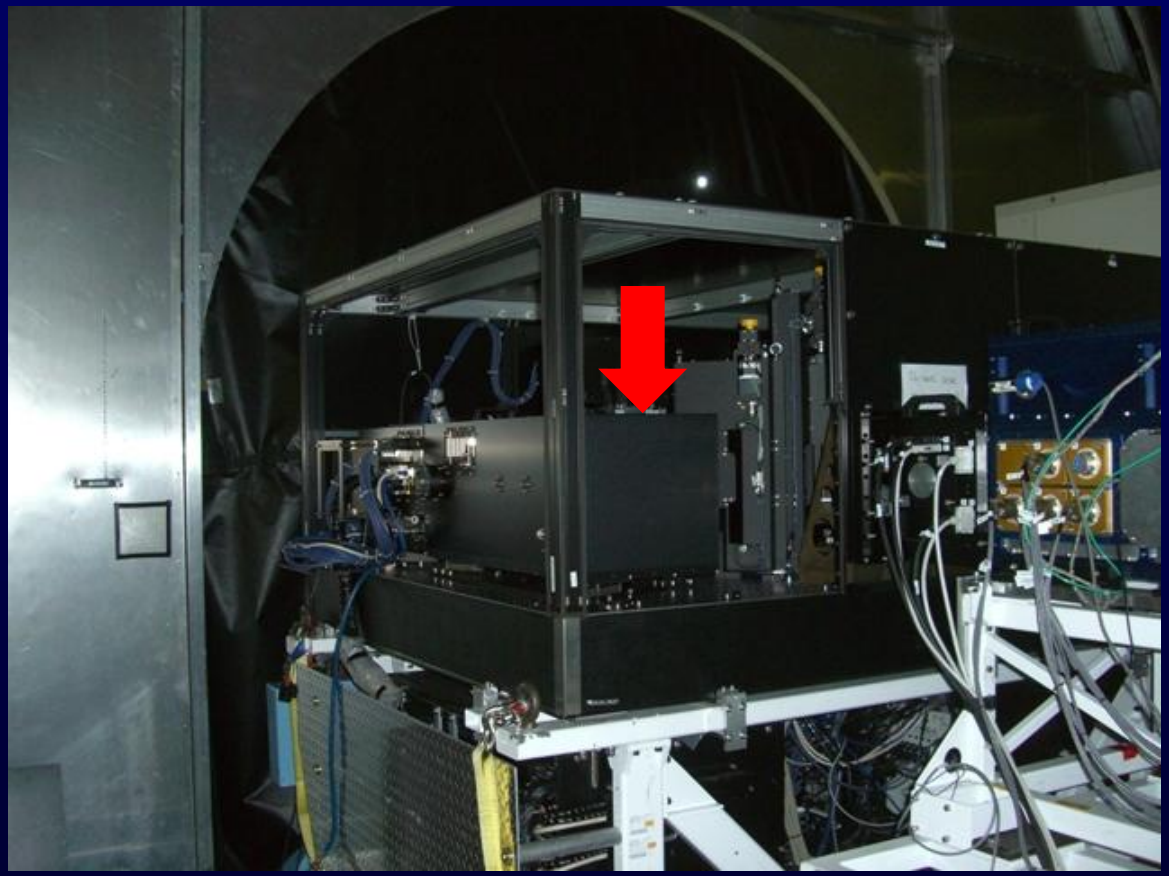


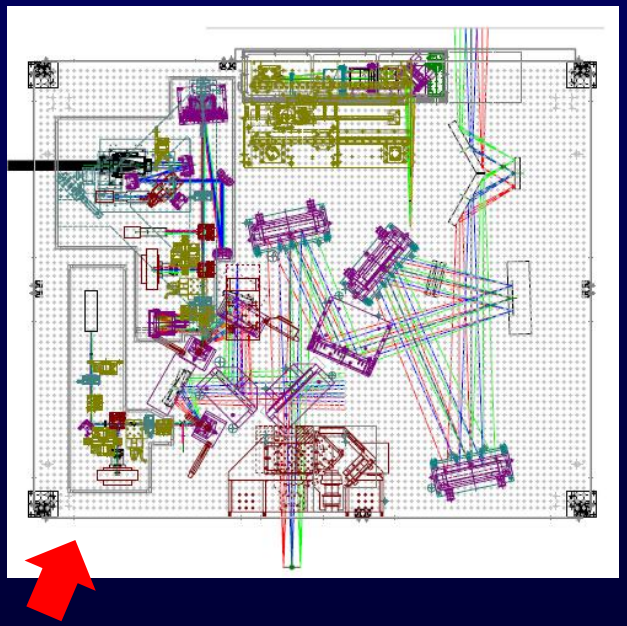
New beam splitter exchange system





Low-order wavefront sensor





LGS mode

- Natural guide star for tip-tilt and focus control.
  - Magnitude in visible spectral band.
  - Separation from the observing target.
- Laser guide star for high-order wavefront control.
  - Location of LGS.
- Other critical information.
  - Elevation angle, the size of the natural guide star.
  - Moon phase, background nebulosity.
  - Non-sidereal object.

What is in 2010.

- Open LGS mode from S10B. Call for Proposal (Feb 2010)
- Risk will be identified in the next engineering observation. (Jan 25 – 29, Feb 5)
- AO188/LGS GT observation will start in S10B.
- Telescope tip-tilt control mode will be open soon.
- Long term system performance. (Throughput etc.)

What is in 2010.

- AO scientist. (Deadline Jan 20)
- Data analysis software.
- AO performance quick look.
- SCExAO commissioning.
- Kyoto 3DII commissioniong.

Progress in 2009.

- Laser launching test resumed. (Feb)
- HOWFS upgrade, vibrating mirror. (Jul)
- Full open use starts. (Aug)
- LGS pointing model. (Jun-Aug, Dec)
- LGS only loop test. (Jun, July)
- Install BS exchange system. (Jul)
- HiCIAO enigneering. (Aug, Nov)
- NH3 Gas cell characterization. (Dec)
- SEEDS (Dec)
- GS acquisition unit for LOWFS. (Dec, install in Jan 2010)
- ADC (Dec, install in Feb 2010)