

Lab Alignment Before Each Night

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The list of things to check is a lot shorter when there is no other change from the previous night except pop changes. In this case only a short alignment check is needed. In case of beam combiner change, or if telescopes are requested on different beams compared to last night, more steps are necessary to get the array ready. There are two procedures to follow accordingly: A) Short Alignment Check or B) Configuration Change.

A) Short Alignment Check (same setup as yesterday)

In the BC and OPLE building

1. Turn on the vacuum pump and start pumping on the line(s) with the highest pressure indicated by the vacuum monitor. Eventually open up all vacuum valves before you get to the M10 alignment.
2. Turn on the green alignment laser and Pico 3 box.
3. Open necessary shutters, move beam samplers out of the way.
4. Check the alignment laser at the target at E1 table. Make sure to check all applicable "VIS-Beams" pairs. Select a convenient 'Iris' size and ND in 'Laser_Filters' using the guis.
5. Turn off Pico 3 box.
6. Make sure that the vacuum valves are all open before you leave the OPLE building.

There is nothing else to be done in the lab or OPLE building for alignment checks. The rest of the checks can be done also from the office building.

7. Set the 'Laser_Filters' to ND=5
8. Start labao servers and guis.
9. Move the telescope beam samplers (BS) to the requested beam positions.
10. Make sure that another BS does not block the laser beam you are about to use.
11. Run the LAB DICH routine by pressing the button on the labao gui, or make the lab dichroic alignment manually (Pico1) with 'Iris' at 'Beam Size'.
12. Repeat for all telescopes to be used.
13. When done, make sure that the lab wfs shutters are closed.
14. Verify the vacuum on the vacuum monitor and do M10 alignments and pop changes if necessary. Select convenient 'Iris' size and ND=0.3 in 'Laser_Filters'.
15. Follow the procedure for beacon alignment check if the beacon is going to be used. (This step has to be repeated at dark right before observation, so it may be skipped for now.)
16. If the Sun is below 35 degrees elevation and the weather is staying predictably good, open the dome slit and set the dome tracking to 'Anti-Sun' using the dome gui.

B) Configuration Change

This procedure is an extension of the short alignment check described above. In this case some elements may have to be placed in/out of the beam in the lab before starting the alignment. This procedure has to be followed also for all those telescopes that were requested on a different beam compared to last time.

1. Turn on the vacuum pump and start pumping on the line(s) with the highest pressure indicated by the vacuum monitor. Eventually open up all vacuum valves before you get to the M10 alignment.
2. Turn on the green alignment laser and Pico 3 box.
3. If changing to/from PAVO or VEGA to/from other beam combiner, make the applicable changes: take PAVO splitters in/out, change tip-tilt splitters, place LDC in the beam.
4. Open necessary shutters, move beam samplers out of the way.
5. Check the alignment laser at the target at E1 table. Make sure to check all applicable "VIS-Beams" pairs. Select a convenient 'Iris' size and ND in 'Laser_Filters' using the gui.
6. Turn off Pico 3 box.
7. Set the 'Laser_Filters' to ND=5
8. Start labao servers and gui.
9. Move the telescope BS to the requested beam position.
10. Make sure that another BS does not block the laser beam you are about to use.
11. Run the LAB DICH routine by pressing the button on the labao gui, or make the lab dichroic alignment manually (Pico1) with 'Iris' at 'Beam Size'.
12. Repeat for all telescopes to be used.
13. When done, make sure that the lab wfs shutter is closed.

Now the rail target and the IR mirror alignment has to be checked. In case of switching to PAVO, in addition to the following steps also follow the instructions for PAVO alignment. No PAVO or tip-tilt alignment is necessary, if PAVO was already set up earlier with other telescopes.

14. Cover the labao wfs cameras, place the corner cubes to the kinematic mount.
15. If PAVO or tip-tilt splitters were moved in/out, the tip-tilt fold mirrors have to be adjusted, see next step. If not go to step 17.
16. Set ND=6 in 'Laser_Filters' using the gui, close shutters, take off the tip-tilt cover, turn off all lights in the lab, go out to ctrscrut.
17. Follow the instructions for changing tip-tilt splitters and set the fold mirror positions using Zaber_2 gui. When done, quit tip-tilt server.
18. Put the tip-tilt cover BACK on.
19. Set ND=0 in 'Laser_Filters' using the gui, open VIS and IR shutters.
20. Place the target either to the MIRCx table (make sure STS is out) or to the CLIMB table (make sure both STS and the MIRCx flip mirrors are out) and adjust the IR mirrors to the target using Pico2 gui.
21. Remove the corner cubes and remove the labwfs covers.
22. Place the rail target onto the rail over the home switch, make sure that the telescope is on the requested beam and no other BS is blocking the laser beam, then check the laser

spot at the back of the target. If the returning spot is off by ~3 mm (1/10 of an inch) or more, adjust the BRT using the brtgtk gui.

23. Move the rail target on to the next line to be checked, and put it aside when done with all lines.
24. Make sure that the vacuum valves are all open before you leave the OPLE building.

This last part can be done from the control room.

25. Do M10 alignments and pop changes if necessary. Select convenient 'Iris' size and ND=0.3 in 'Laser_Filters'.
26. Follow the procedure for beacon alignment check if the beacon is going to be used. (This step has to be repeated at dark right before observation, so it may be skipped for now.)
27. If the Sun is below 35 degrees elevation and the weather is staying predictably good, open the dome slit and set the dome tracking to 'Anti-Sun' using the dome gui.