

Palomar Adaptive Optics Test Plan

Title	Laser power-up
Version	1.0
Date released	8/12/2007
Lead	V. Velur
Time requested	1 hr prior to laser use
Required conditions	N/A

Purpose

- Safely power up laser.
- Optimize laser power, frequency tuning.
- If necessary, reduce power for alignment procedures.

Test procedure

A. Power up laser

1. Top up water in large chiller.
2. Switch on both chillers (button/switch on front of each).
3. Press white button on laser controller, labeled "Laser Flow".
 - 3.1. Pressure should read ~50 PSI, flow should read ~0.7 Gal/Min.
4. On temp control laptop, right-click on each window and restart display (on 1.06 AOM, 1.06 Etalon, 1.32 AOM, 1.32 LBO). Wait for temps to stabilize.
5. Verify that both IR beams are blocked (two flipping blocks, one next to 1.32 diodes, one near SFG)
6. Verify that laser function generator is set to 1 (=10 Hz pulses)
7. Switch photodiodes on (1.06, 1.32, 1.06 diode).
8. On both diode power supplies (Analogue Modules):
 - 8.1. Turn key switch to on.
 - 8.2. When alarm stops, hit "A" (pulse mode operation)
 - 8.3. Press "run" (**High power IR – green or purple goggles required**)
9. Turn up laser function generator dial to 36 (=360 Hz pulses).
10. Verify that both lasers are lasing. Pulse shape should now look reasonable.
11. IR laser optimization
 - 11.1. *To be documented...*
12. Verify that IR beams shapes are good
 - 12.1. Flip prism in front of SFG into beam.
 - 12.2. Unblock both IR lasers.
 - 12.3. Verify reasonable spot shapes.
 - 12.4. Block IR beams.
 - 12.5. Remove prism.
13. Verify that LBO temp display is at ~41.9 C (lowest left in rack).
14. Press "enable" on Na cell temp controller (lowest right in rack).
15. Check 589nm unmodelocked power.
 - 15.1. Turn on power meter and insert in beam just ahead of output optics.
 - 15.2. Zero power meter.
 - 15.3. Open IR beam blocks (**High power 589nm – purple goggles required**)
 - 15.4. Record power.

16. Mode lock IR lasers.
 - 16.1. Turn "1.06 power adjust" knob clockwise until you reach black mark (=2).
 - 16.2. Turn "1.32 power adjust" knob clockwise until just above black mark (=4).
17. Adjust "Phase Control" knob until 589nm power is maximized.
18. Frequency adjustment (when Na cell has reached ~69 C)
 - 18.1. Adjust horizontal actuator on 1.06 etalon to maximize fluorescence as seen in oscilloscope output.
19. Record power and remove power meter from beam.
20. Laser is ready for observing.

To change to low power for alignment

1. Insert power meter just before output optics.
2. Dephase the IR lasers by adjusting the "phase control" knob to achieve desired power.
3. Remove power meter.

Results and conclusions