

June 25, 2007 Laser IPT Meeting Minutes

A. Bouchez

Caltech: Bouchez, Martin, Roberts, Pickles, Petrie
Palomar: Doyle, Tripathi
JPL: Shelton

1. Discussion of upcoming laser work

- See status report by Renu in appendix below
- John and Steve will be at Palomar on Wed. 6/27 to work on TE cooler control and monitoring software. Renu will work with them to test software modes. Laser will be off (chillers on).
- Amplified photodiode for Na cell has arrived. Mechanically it's a direct replacement (1" tube, BNC out), with on/off and gain switches. Steps to implement are below. Postponed this work until 589nm light is available (week of July 9).
 1. Install photodiode.
 2. Circuitry change is needed in logging box. CS and JH have coordinated electronics switch necessary.
 3. Adjust loop gain (trim pot in circuit box) needs to be adjusted.
- Need to reduce non-linearity of photodiodes on laser bench. Chris suggested adding ND filters and adjusting electronic gain accordingly. Again, postpone until week of July 9.
- Strategy for Na cell SNR improvement:
 - Install amplified photodiode (details above)
 - If still not sufficient signal, then consider optical change.
- Chris will send out Zemax models of laser cavities and output optics.
- Renu pricing replacement flow switches. Will order replacements once approved by Ed.
- Renu checked on 660nm laser this morning, and removed baffle which was blocking the beam.
- Antonin to order two sets of goggles: 589nm alignment (OD 2+) and 660nm protective for dome personnel.

2. Schedule of upcoming work

6/25 - 6/29	Align diodes and optimize cavity of 1.32um laser. Perform knife-edge test on 1.32 laser.
7/2 - 7/3	Match beam profiles (1.06 um laser has 0.66 mm FWHM at OC)
7/9 - 7/13	Align beams through SFG and output optics.
7/16 - 7/20	Contingency, and AOA wavefront sensor experiment if time available.

Michael to use Diagnostics PC from 4pm onward each day this week. If Renu is running late, will contact him at 626-395-8377 or email.

3. Appendix A: Laser status

(Renu email dated June 25, 2007 8:42:25 AM)

1. Made a telescope with CCD camera attached to the frame grabber to do real-time image processing on the IR fluorescence: done
2. Open the laser head and pumping diodes from both 1.06 & 1.32 micron lasers, check the diodes' powers individually, use different spacers to change the effective pump area, and check its effect on laser stability and power: done for 1.06 laser, halfway on 1.32 laser

3. Align the laser in each case, optimize power, mode-lock, check for stability: 1.06 laser complete; 1.32 laser needs more work
4. Measure polarization of both lasers: PBS introduced in the 1.06 cavity close to the output coupler. It gives optimum output in desired polarization.
5. Check both laser modes in the Spiricon
6. Replace existing KTP in the 1.06 micron laser with the new anti-gray-tracking KTP: done
7. 1.06 summary (for two spacers – final configuration): 100Hz: 6.8W; 200Hz: 11.6W; 300 Hz: 19W; 380Hz: 23.5W (mode-locked power: 21.5W with good spot on Spiricon)
8. M^2 value = 1.19 (from knife-edge test)
9. 1.32 laser: we did trials with 1, 2 and 3 spacers. Right now, its set with 2 spacers. This gives ~ 70% lasing efficiency. This laser needs more fiddling in terms of alignment by adjusting diodes.

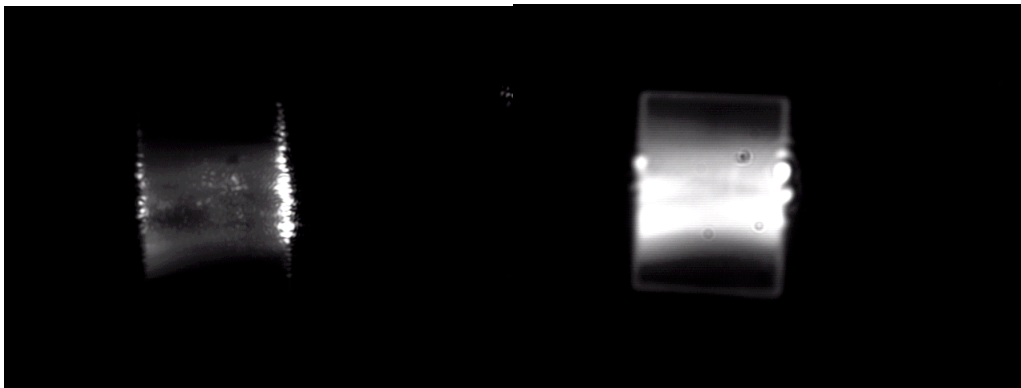


Fig 1: Fluorescence pictures for 1.06 laser before (left) and at optimum config. (right).

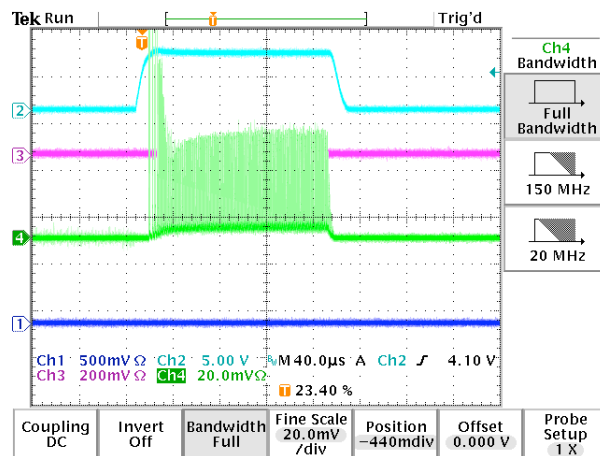


Fig 2: 1.06 um laser pulse shape

Meeting adjourned at 9:40 am.