

June 18, 2007 LGS Facility IPT Meeting Minutes

A. Bouchez

Caltech: Angione, Bouchez, Cromer, Martin, Petrie, Pickles, Roberts
Palomar: Henning, Kibblewhite, Sweet, Tripathi
JPL: Shelton

1. Laser

Summary of work performed over the last 5 days:

- Built TV system to measure fluorescence of Nd:YAG.
- Adjusted size of pump region in slab. At start was 0.4 mm thick. Adjusted to ~1.0 mm. This significantly reduced the power in the parasitic mode. Approximately 90% of fluorescence goes into output laser power (coupling between Nd:YAG fluorescence and laser beam is still acceptable).
- Carefully aligned 1.06 μ m laser - got 23W stable for 1.5hr, then polarizer coating failed. Realigned to different location on polarizer and now have 21W mode-locked.

Notes:

- 1.32 μ m laser might also benefit from adjustment of pump volume.
- Experienced a near-fatal (to hardware) incident on Friday. The laser was powered up at 100 Hz while cooling system was on "bypass". All 4 flow switched in series malfunctioned "closed", allowing the laser to be powered up. Laser was powered down after noticing that diode modules were hot. Apparently no damage done, but diodes would have been destroyed if laser pulse frequency had been increased. RT to order new flow switches. Until they are installed, will operate without interlocks. **Use extreme caution.**
- Coating on "high-power" polarizing beamsplitter cube was damaged over the weekend. Beamsplitter cube was near the output coupler, in standard 1.06 μ m cavity. Could move it with the KTP crystal to the larger end of the cavity, but might not make very much difference (beam diameter ~1.4 larger). RT to purchase a new, higher spec'ed polarizing cube from CVI.

Work remaining (Ed departs Wed. morning):

- Install astigmatic lens to circularize 1.06 μ m beam profile.
- Measure spot sizes. Spiricon provides approximate measure.

More notes:

- If circularization of 1.06 μ m laser using cylindrical lenses is successful, could consider doing same to 1.32 μ m laser.
- Higher power should improve sum-frequency conversion. Old LBO crystals have burn marks on faces, but are still usable. Also have new crystals in hand. Co-alignment of IR lasers, alignment of SFG unit, and output telescope remain to be done after Ed's departure.

2. Laser automation

Notes on progress on laser automation software from Steve G. email:

- lgs->harbor data recording working
- starts up attempting to record data but not a big deal if it can't.
- changed LGS so that it won't shut down the temperatures on program termination.
- how-to doc (beta) uploaded to twiki.
- renu appeared to be running the lgs software when i checked mid-week.

RT has been using linux system for temperature control, and noted that it is apparently not initializing some of the temperature channels (KTP crystal). More testing time (with chillers on) required to test software. EK objected to chillers and temperature control being run without himself or RT present. JA suggested that testing would be most efficient with him and SG on the

mountain. JA and SG to schedule a day at Palomar (next week?) with RT present to complete software testing.

3. Laser safety

Standard Operating Procedure meeting, originally scheduled for this Thu., may need to be rescheduled. JC will follow up with email.

4. Laser diagnostics

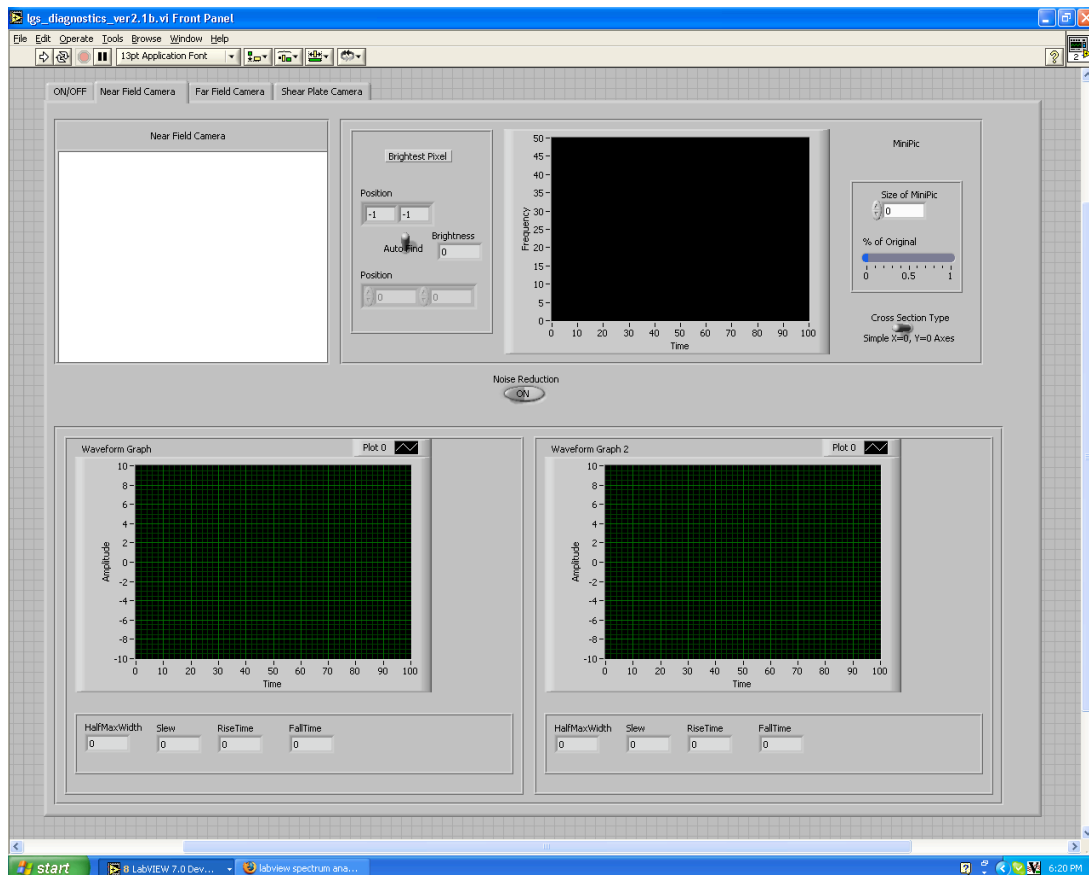
A conflict over the use of the Diagnostic PC occurred Friday. All agreed to do a better job communicating over use of PC in the future. Laser use (RT and EK) has priority at present. RT suggested that we procure a second PC for general laser engineering use (would need a frame grabber). No decision made on this.

Schedule for this week:

Michael Martin will use the Diagnostics PC 12:00-13:00 Monday and Tuesday. He will communicate with Renu regarding use on Wed. Thu-Fri. he can use PC all day.

MM presented draft Matlab GUI (see below), and requested input and comments. Suggestions:

- Display just FWHM (no rise time/fall time/etc.)
- Plot sum over columns/rows over subimage, rather than traditional cross section (more robust against centering error).



Meeting adjourned at 9:55am.