

ANU laser Vendor
AITC Meeting Room Stromlo
Chair: Steve
Secretary: Chris

Friday 22nd of September

Summary:

Interfacing with the ANU laser vendor and confirming requirements and preferences with design

Actionable Items:

- Try and move the auxiliary box closer to the laser system
- Try and keep the temperature of the laser temperature minimum 10 degrees
- It doesn't matter whether CAN bus, or ethernet system is used
- Try and keep it all in one package as that is better for both Celine and vendor

Attendance:

Greg (G), Steve (S), Paul (P), Chris Leow (CL), Celine d'Orgeville (CD), Wenjie (W), Alex (A)

Agenda:

Item	Discussion	Actions + Responsibilities
Meeting Open	10:42am	
Vendor Question	<p>S: Follow up the questions. Auxiliary cabinets may have vibration sensitive components? G: Anything we have will not produce vibration of significance. Planning of getting water as a coolant, there are no pumps. S: Fans on power supply? G: There will be undoubtedly be some fans S: Preference on cabinets that you are using? G: Where do you envision the laser, head sitting? CD: Auxiliary cabinet will be near the telescope so that it can't have issues with the telescope moving in azimuth S: Large cabinet to be on the ground floor giving 8m CD: Upper limit for electronic cabinet size. G: 66cm² x 1.5m or 1.3m. is realistic. 2ft x 2ft x 4 ft. S: Can go on top floor easily and be fixed and can be routed</p> <p>S: Cooling – coolers set to 17 degrees, a single cooler for both lasers would be optimal. G: Can't answer the question yet, there are 2 lasers in the system. One delivers pump light and 589nm light, that may run at two</p>	

	<p>different temperatures and the material design.</p> <p>CD: Do you have a range it could be within</p> <p>G: I think I provided the range.</p> <p>S: 10-30 degrees range. Do you expect the two laser components to be at different temperatures?</p> <p>G: If all works out well they will be the same but they could be very different. Semiconductor chip power is dependent on temperature. Easier to change temp than grow crystals.</p> <p>CD: Cheaper</p> <p>G: engineer the crystals</p> <p>S: Easier on our end for coolants to be supplied.</p> <p>G: You didn't ask me how much flow it needed?</p> <p>S: Are there values for that?</p> <p>G: 8L/min for the entire laser system</p> <p>S: Standard tap water? Or deionised water?</p> <p>G: Need to put alcohol in there if it intends to go to 0 degrees.</p> <p>CD: Glycol running to the semiconductor chip? Issues with corrosion?</p> <p>G: If we could raise 0 degrees to 5 degrees then we won't need to worry about it</p> <p>CD: Design something for the</p> <p>G: Issue is not when it's running it's when it's sitting. If we aren't running and it goes to 0.</p> <p>CD: Make it a requirement to make sure the laser never goes below 5 degrees</p> <p>S: EOS laser has a standard heating element that could be ported across to the ANU laser. Or heating on the box. Standby generator. Look into how much it has in case power goes out.</p> <p>G: Freeze resistant coolant</p> <p>S: Power and control systems. Power is at 50Hz and double check</p>	
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	<p>CD: Double check because it was in Hawaii</p> <p>G: If you just tell us than it will be fine it's just a simple transformer</p> <p>S: Do you have anything in mind for control systems CD? Are there any limitations?</p> <p>CD: What it is we need to control in the laser and the interface for it. On/off and standby and operation mode. Alignment in between.</p> <p>G: Do you need spotters? To do that nicely go to standby</p> <p>CD: Close the laser shutter. I assume it would be in your system because it's standard. Internal or external.</p> <p>G: Diagnostics coming back</p> <p>CD: If they are in the laser than you need it too</p> <p>G: The laser has its own computer control system. You can run a CAN BUS as long as you are giving them the right maths. Possible to be done by ethernet. Can be any interface 232, 488.</p> <p>CD: Interface talks to the computer. DO you know what computer it will be?</p> <p>G: Don't know. Some windows device.</p> <p>CD: Idea is use whatever you are comfortable with and we can make the prototype work. If it makes sense to develop something else and talk about it later.</p> <p>G: Can do a Linux system.</p> <p>CD: Think about OS options to consider. I don't care as long as it works when I push the button.</p> <p>S: Vibration. Highly sensitive components or reasonably tolerant.</p> <p>G: asking the laser to do is whisper at the atomic level, we have had to dampen out vibration from pumps and fans. Within the chassis of the laser head and there should have some vibration dampening. In the plot the system is already dampened really well.</p>	
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	<p>S: Performed in the lab space. There could be additional issues in the telescope. But no values just yet.</p> <p>G: Get further down the road in the design than there is no way they can answer them now</p> <p>CD: Action item, to provide better vibrational analysis information for the vendor in future projects or now.</p> <p>S: 610x305x305mm laser head 2ft x 1ft x 1ft might be bigger but not by much.</p> <p>G: Might be wider. We need to package the pump laser. If you could reduce that 8m it would make a big difference to me.</p> <p>CD: Send G the telescope dimensions</p> <p>G: That drives the decision to run a fibre optic, or electrical cable</p> <p>S: Could be dropped down to 4m, or 1m.</p> <p>G: Makes a huge difference. If it is a long distance away than I need the pump laser in the same package as the obsle. I need to run a heavy electrical cable that can run a lot of current. If it's close I can run the pump light by fibre to the obsle, and package the pump laser in the auxiliary cabinet.</p> <p>S: Is there a range?</p> <p>G: Interact with pump laser vender. Standard fibre length is 1m, but need surplus. 8m non-linear optic effects in the fibre.</p> <p>S: Bring it as close as possible and check floor arrangement.</p> <p>G: If you could do 2m that would be intriguing. We don't want a rainbow coming out the pump laser.</p> <p>CD: You going to have that conversation with the pump laser provider.</p> <p>P: explaining the telescope configurations for routing cables</p>	
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	<p>G: Cabinet can't go right beneath the laser head?</p> <p>S: Could go to the left or right, but may be able to meet the space.</p> <p>G: Would be best if we could put them together for a sales pitch</p> <p>A: Could be possible</p> <p>G: Talk to vendor about the pump and see what they recommend. If it's just an electrical wire it's not a big deal making it doable, but less than desirable.</p>	
	<p>S: All the questions we had to follow up.</p> <p>G: Sparked some questions that I had. Important thing to realise the thermal aspect is critical and definitely want plenty of margins on either side and 0 degrees is scary.</p> <p>W: Is there an ideal ambient temperature range.</p> <p>G: Great if it could be 10-30 degrees. It would be excellent.</p> <p>Operational and inactive temperatures need to be specified.</p> <p>Inactive can tolerate broader range, but need to check coolant.</p> <p>S: Do you have expectations of start-up time? Cold start up...</p> <p>G: We will be ready before they (EOS) are. Good stability within 30min. That's a guess. Could be 5 or 45 min. could be 30 seconds.</p> <p>There will be some thermalisation time, but shouldn't be horrible.</p> <p>CD: Ideally coolant should be at right temperature from the start</p> <p>G: Our laser game material is only 4 micron thick and 10 mm wide.</p> <p>Not taking long to get up to temperature. Exciting because it's incredible.</p>	
	<p>CD: Anything else you need to ask G?</p> <p>G: I know CD is going on vacation so you can send questions straight to me.</p>	
Meeting Close	11:22am	