

Dave Barney, CERN

STATUS OF NEW LASER SYSTEM

The Basics

- Motivations

1. Less maintenance intensive; maintainable for next ten years or more
2. Improved long-term stability (linked to 1)

- Specifications

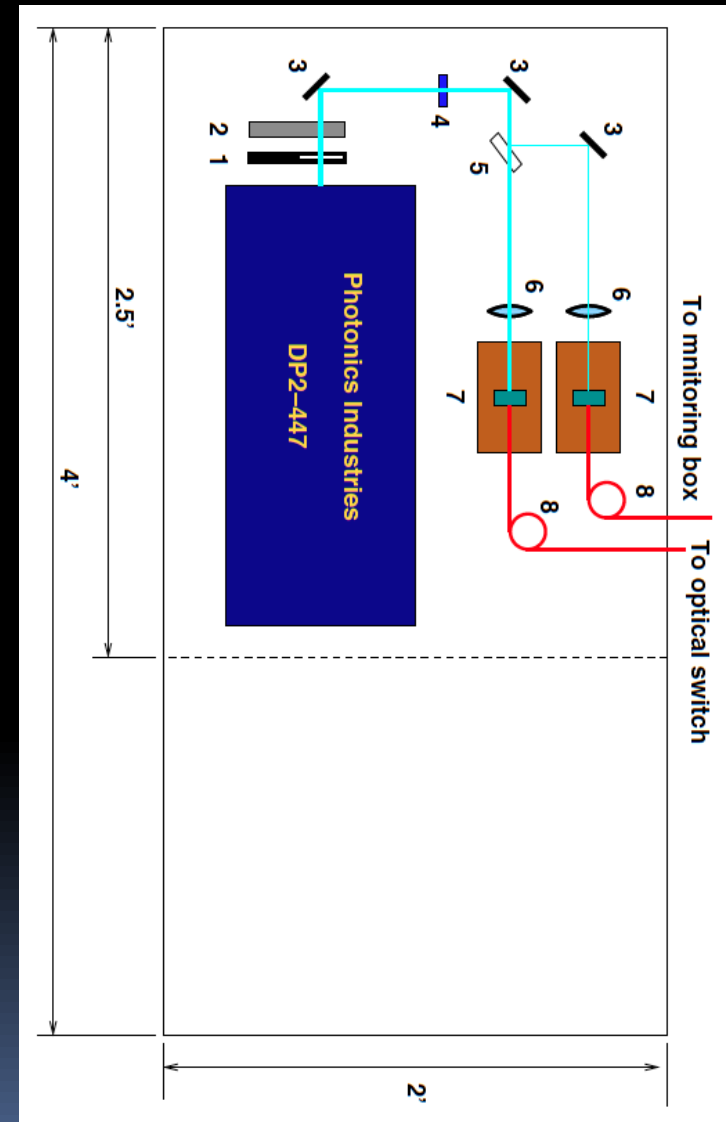
1. 24/7 operation for many continuous months
2. Stability at least as good as current system
3. Relatively simple inclusion into present system
4. As short a delivery time as possible

Options

- Quantronix (manufacturer of existing ECAL lasers)
 - Ti:Sapphire pumped diode laser @ 440nm
 - Met specifications
 - Long delivery time (~6 months)
- Photonics
 - Two options:
 - Ti:Sapphire pumped diode laser @ 440nm
 - Single diode laser @ 447nm
 - Both met specifications & relatively good delivery time
 - Selected the 447nm option (see <http://cern.ch/go/W9VD> for details)

Choice: DP2-447 laser

- Relatively simple
 - 1 laser system (c.f. 2)
 - Compact - 368 x 660 x 127mm
 - Very low power – no need for separate cooling
 - Off-the-shelf spare parts available (at reasonable price)



Procurement Status

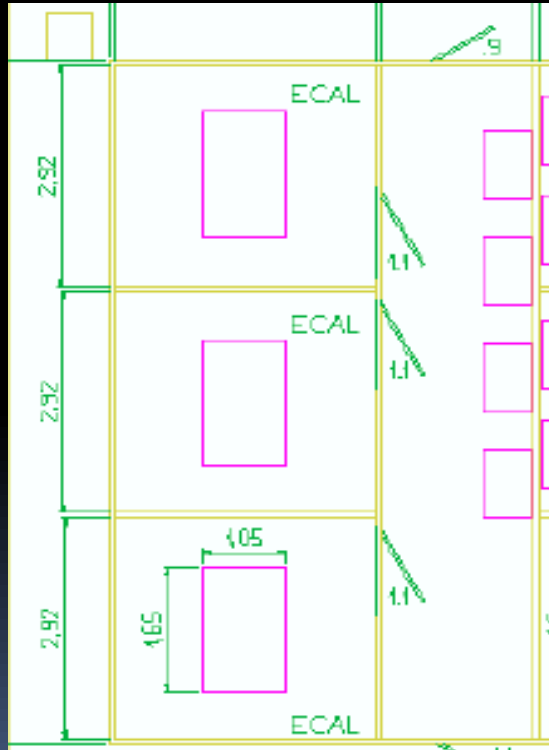
- Funding assured
 - Laser system: US M&O (\$170k + taxes etc.)
 - Ordered. Due to arrive at Caltech ~end of January
 - Manpower for testing, commissioning (@Caltech initially, then at P5): US M&O (~\$60k)
 - Ancillary equipment: ECAL M&O (~\$50k)
 - Quotations obtained for most items
 - Orders should be placed this week or next
 - Items will mostly be delivered to Caltech before being shipped back to CERN
 - Spares for new laser: ECAL M&O (~\$25k)
 - To purchase spare diodes, windows etc. in advance

Preparations Needed

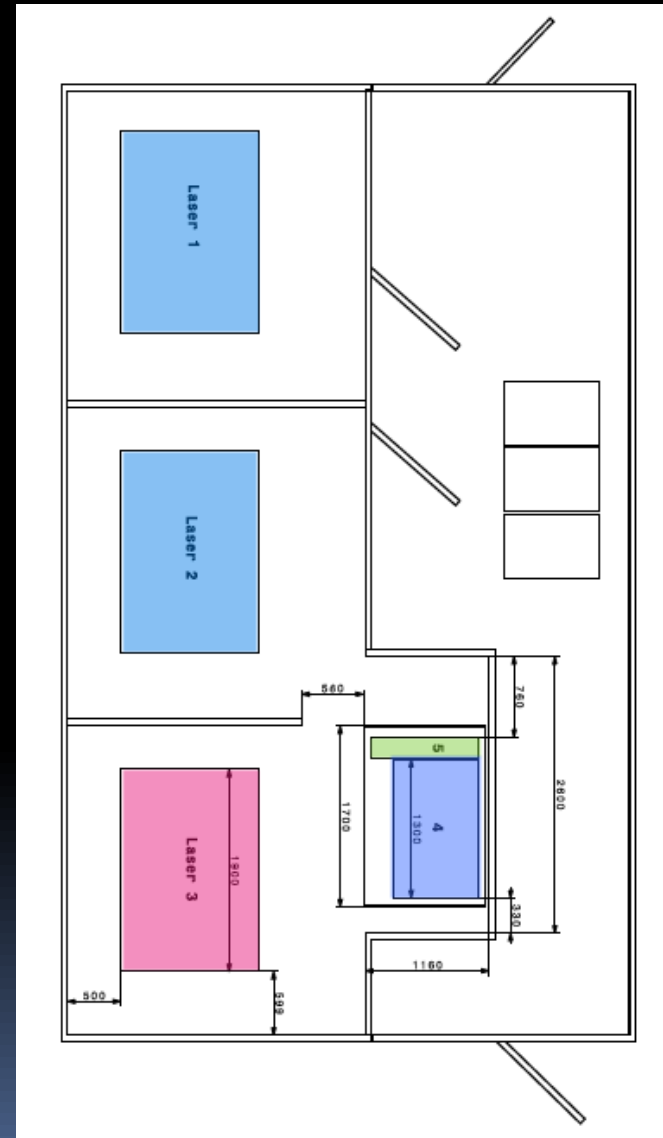
- Location for the laser
 - New area in existing barracks (see next slide)
- Operation in the magnetic field (no info from manufacturer)
 - Preparations for magnetic shielding
- Integration with existing lasers
 - Switches, laser supervisor, MATACQ etc.
- Modifications to timing/triggering
 - New laser has a delay of $\sim 90\mu\text{sec}$ (>1 bx)

Preparations @ P5

- Laser barrack layout will be modified to accommodate the new blue (and new green) laser



Existing Layout



Commissioning

- First commissioning (5-6 weeks) in Caltech
- Then ship to CERN (1-2 weeks) and install/commission in P5 (~2 weeks)
- Aim to operate the new blue laser and (at least one) existing blue laser in parallel for at least a month (possibly more – depending on what we find)
 - Also operate IR & green lasers in parallel
 - First switch has 5 inputs (e.g. 3xBlue + 1xIR + 1xGreen)

Schedule

- Laser delivered to Caltech by end of January
- Commissioning @ Caltech until mid-March
- Commissioning @ P5 until beginning of April
- Run in parallel until (at least) end of April

#	Info	Title	# Predecessors	Expected Start	Expected End	% Complete	Q2 / 2011		Q3 / 2011			Q4 / 2011			Q1 / 2012			Q2 / 2012							
							05	06	07	08	09	10	11	12	01	02	03	04	05						
0		CMS ECAL DP2-447 Laser...		11/1/11	4/30/12	2%	CMS ECAL DP2-447 Laser Procurement & Commissioning																		
1		Procurement		11/1/11	2/8/12	3%	Procurement																		
2		Laser		11/23/11	1/31/12	0%	Laser 2.05 months																		
5		Ancillaries		11/1/11	1/30/12	4%	Ancillaries 2.8 months ?																		
81		Laser barrack		11/30/11	2/8/12	0%	Laser barrack 2.1 months ?																		
101		1x100 optical switch		11/30/11	12/5/11	0%	1x100 optical switch 4)																		
106		Commissioning @ Caltech	2; 5	2/1/12	3/6/12	0%	Commissioning @ Caltech 1.2m?																		
110		Transport to P5	106	3/7/12	3/19/12	0%	Transport to P5 1.8w																		
114		Preparation of P5		11/1/11	2/15/12	0%	Preparation of P5 3.4 months ?																		
124		Install & Commission at P5	113; 114	3/20/12	4/2/12	0%	Install & Commission at P5 2w?																		
130		Operation	124	4/3/12	4/30/12	0%	Operation 1 month																		