



Update on SVD module construction



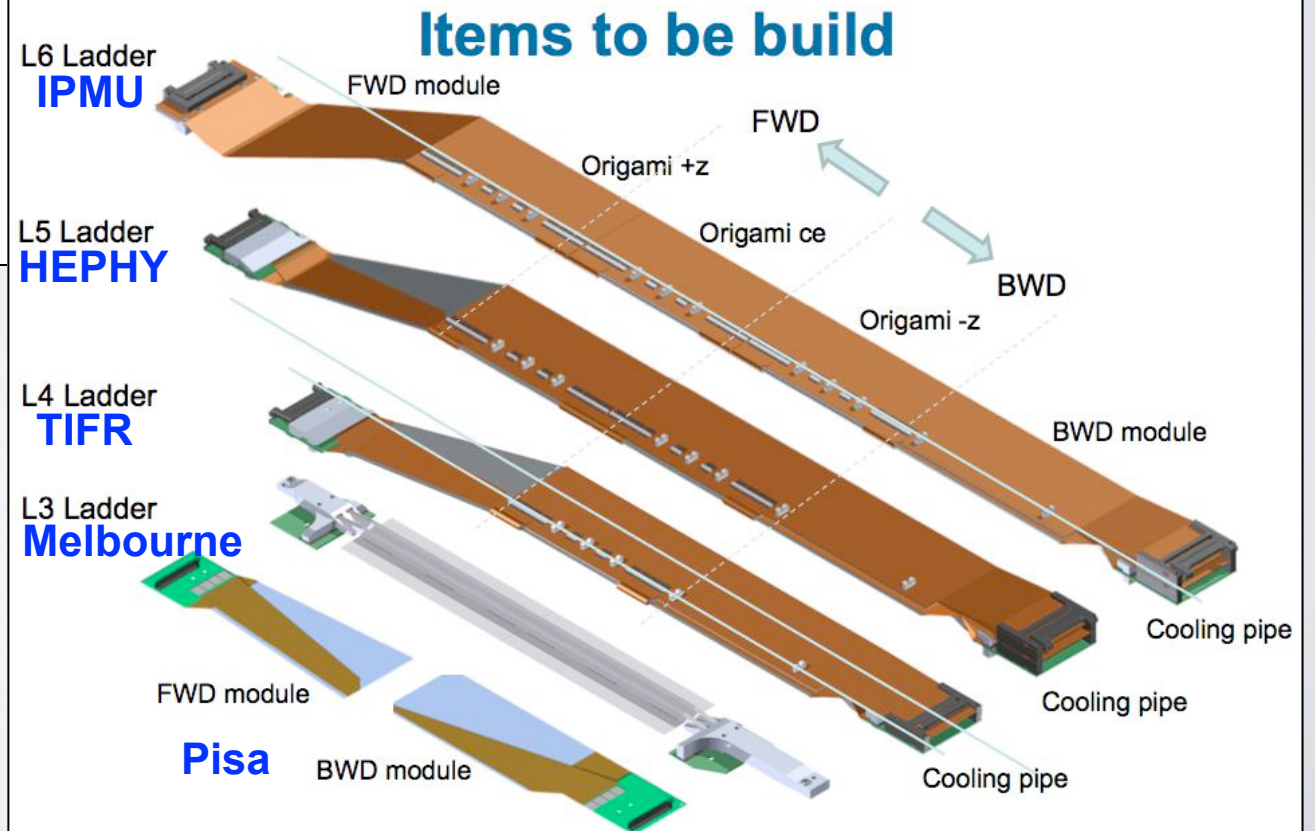
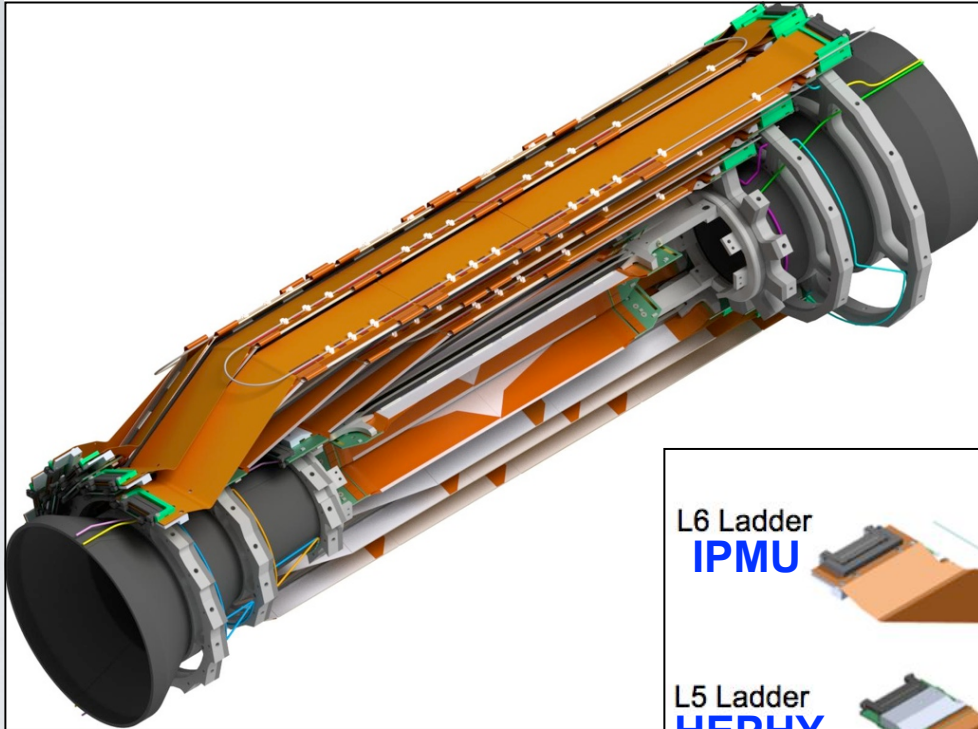
Antonio Paladino for the Pisa group - 22/12/2015
Roma - 4th BelleII Italian Collaboration Meeting

Outline

- Overview
- Common issues: Keratherm and Origami status
- FW/BW status - Pisa
- L3 status - Melbourne
- L4 status - TIFR
- L5 status - HEPHY
- L6 status - IPMU
- Schedules
- Interference test
- Desy testbeam



SVD overview



Review summary

	2014			2015													
Site	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	
FW/BW-Pisa	CCQ							CBQ									
L3-Melbourne							PCCQ				CCQ			CBQ			
L4-TIFR					PCCQ			CCQ							CBQ		
L5-HEPHY				PCCQ							CBQ						
L6-IPMU	PCCQ									CCQ						CBQ	

TODAY

	Development
	Class C production (mechanical)
	Class B production (electrical)
	Class A production

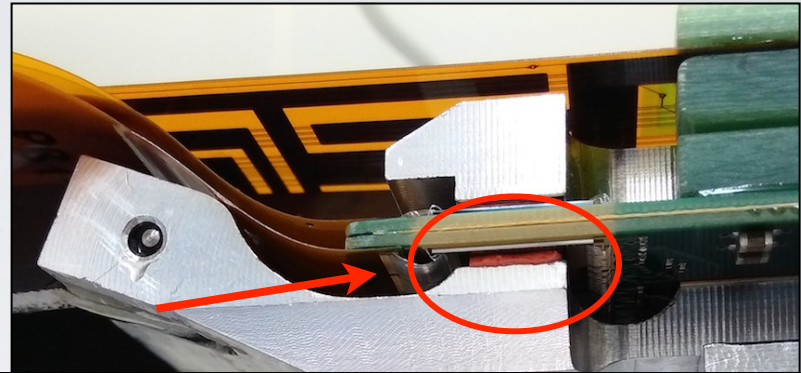
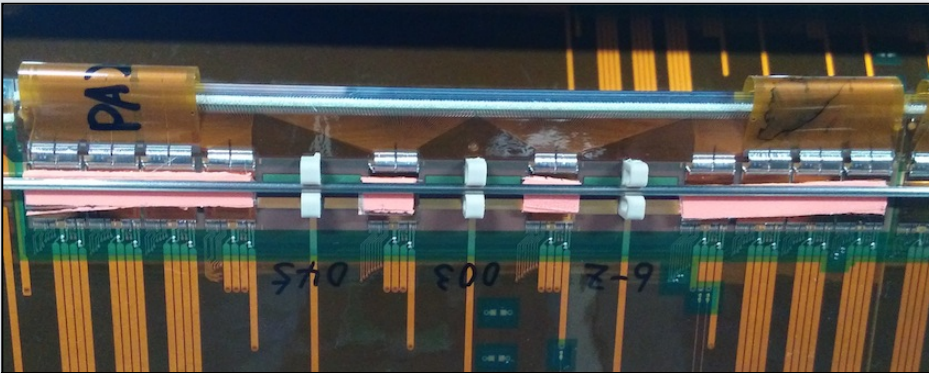
PCCQ - Preliminary class C qualification

CCQ - Class C qualification

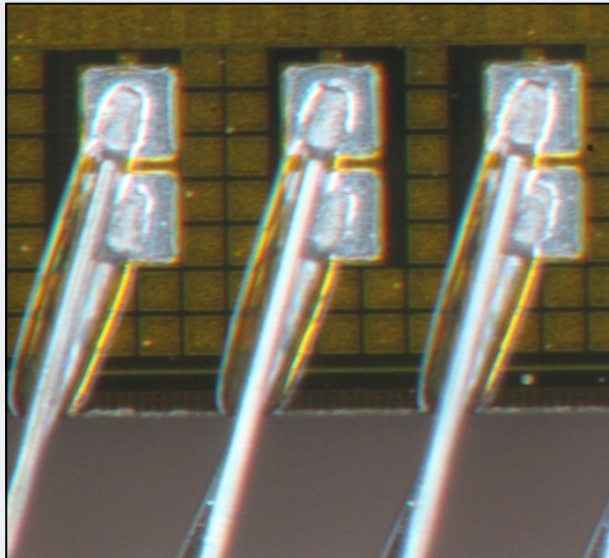
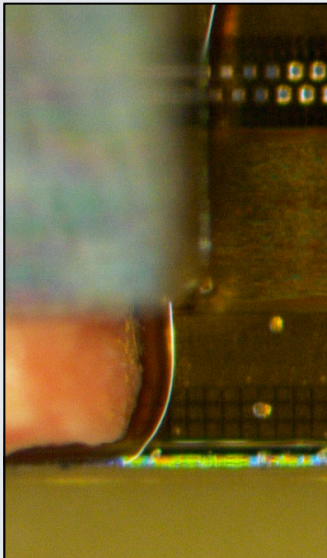
CBQ - Class B qualification

CAM - Class A monitoring

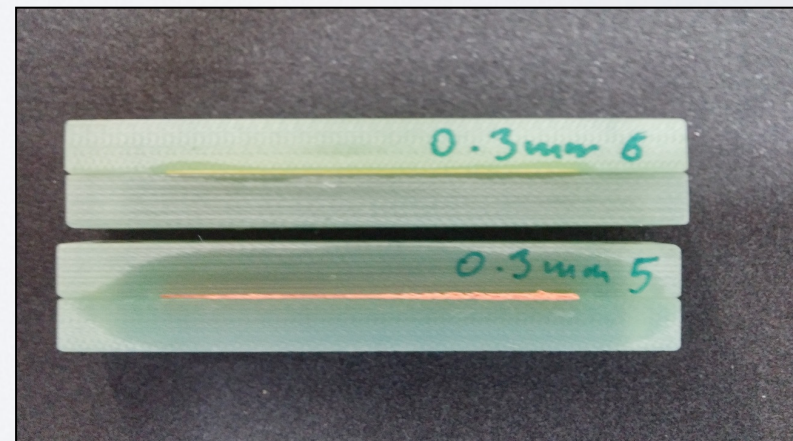
Keratherm issue



The soft material that will provide thermal contact between APV chips and cooling system was found leaking some (inert) oil.

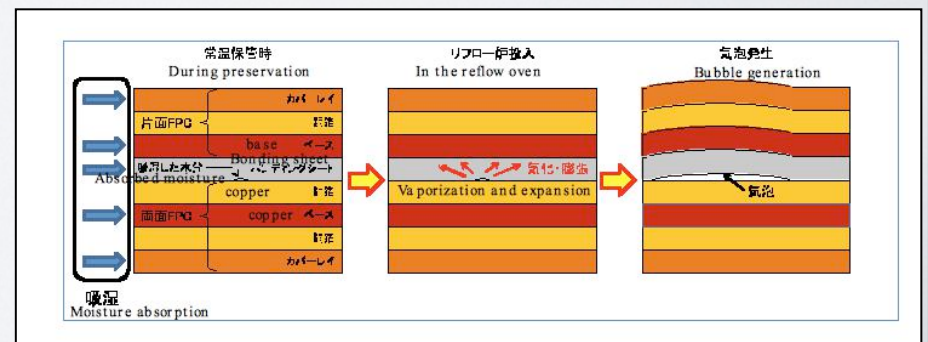


Another similar material was found. It was tested and irradiated. It is still leaking, but less than the other, so after all tests and discussion, two weeks ago a decision was taken: the new material will be used.



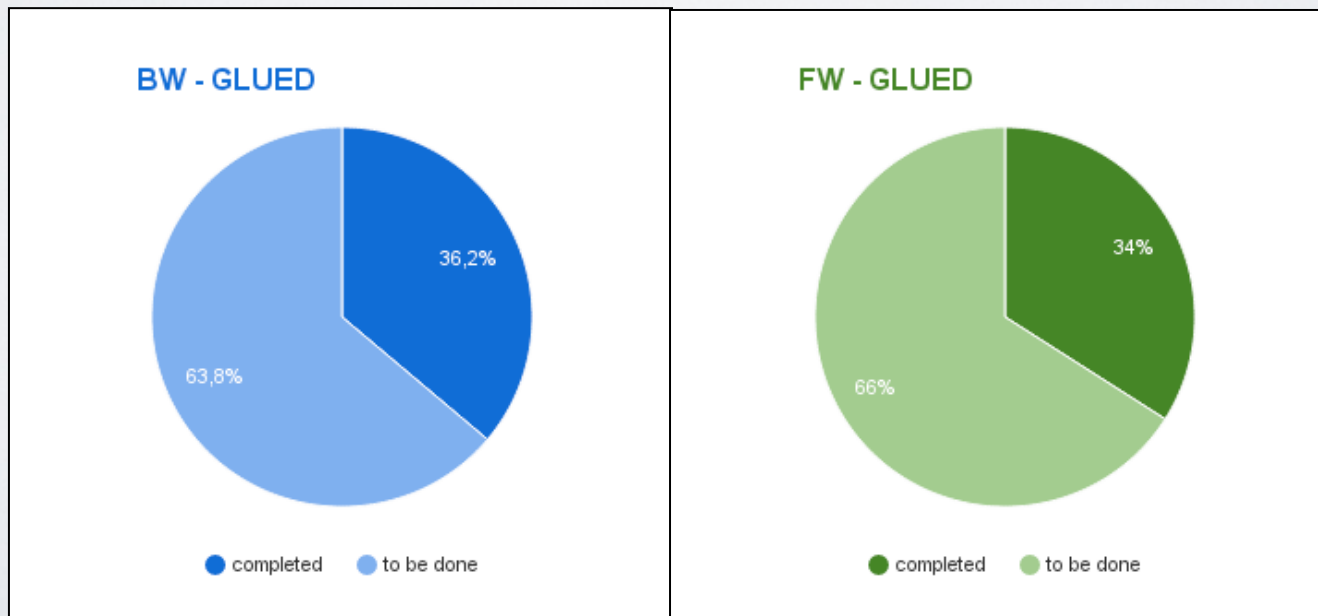
PA0 and ORIGAMI status

- ◆ Old problem of cracks on PA0 solved: between august and september mass production started, all PA0 were tested and no cracks were found.
- ◆ ORIGAMI assembly started on october 2015. To be produced in three different batches to be delivered between dec 2015 and feb 2016.
- ◆ At the end of november 2015 a new problem arose: during the reflow step of the first batch large bubbles were observed.
- ◆ Bubbles very likely due to humidity absorbed by the circuits, which expands in the oven (“moisture explosions”) with high temperature cycle during reflow.
- ◆ Possible cure: baking at low temperature to avoid moisture explosion.
- ◆ Dec 21th meeting with the companies to discuss the cure and the impact on production schedule:
 - ◆ 1st batch maybe ready for march
 - ◆ previous batch 0 ORIGAMI still available for production.



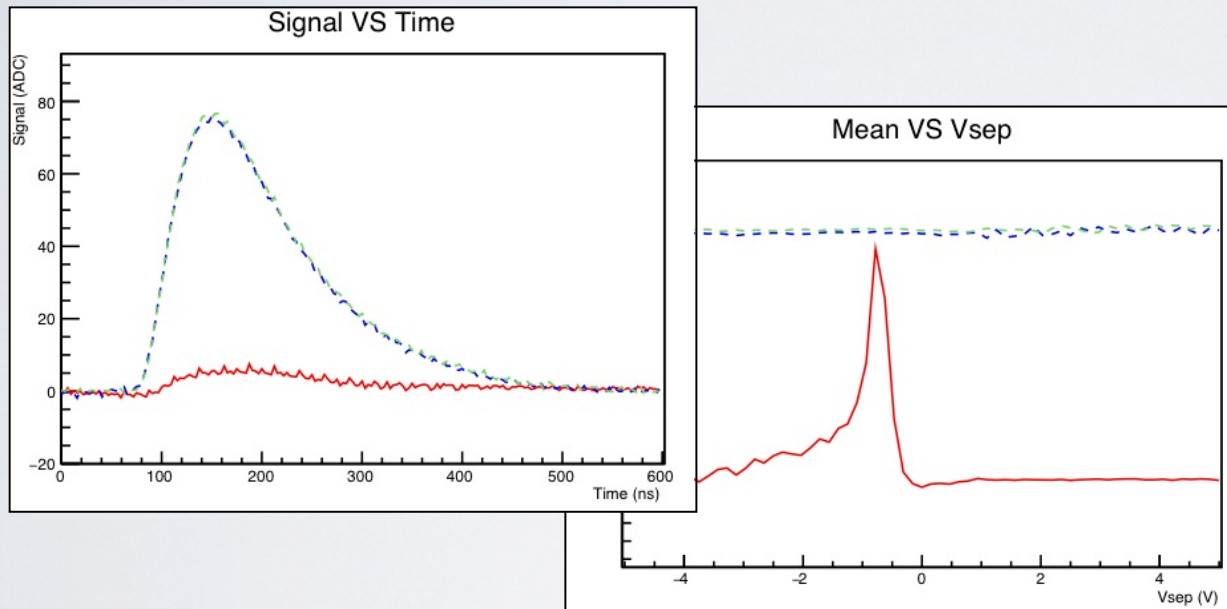
FW/BW status - Pisa

- ◆ **47 SFW + 47 SBW** to be produced: hybrid sandwich assembly and test, sub-assembly gluing, wire bonding and testing.
- ◆ Mass production started in july for class A sub-assemblies.
- ◆ It was decided to replace a coupling capacitor on the hybrid boards, so we stopped for two weeks in september waiting for the decision and then we started again at a lower production rate to work also on this change.
- ◆ The decision caused collateral effects: all the multi purpose chucks (MPC) used to hold the sub-assemblies needed a rework to deal with new capacitor dimensions, and this slowed down our production rate.
- ◆ According to possible production rate and delays accumulated, we should end production in may.



FW/BW status - Pisa

- ◆ The electrical test done so far show that our manufacturing process is introducing very few defects to the existing ones of the sensor, on average less than two per sub-assembly.
- ◆ An automatic program named “aDefectFinder” was developed by Giulia Casarosa to spot defects from the electrical test data. This program is now being used by all sites for data analysis.

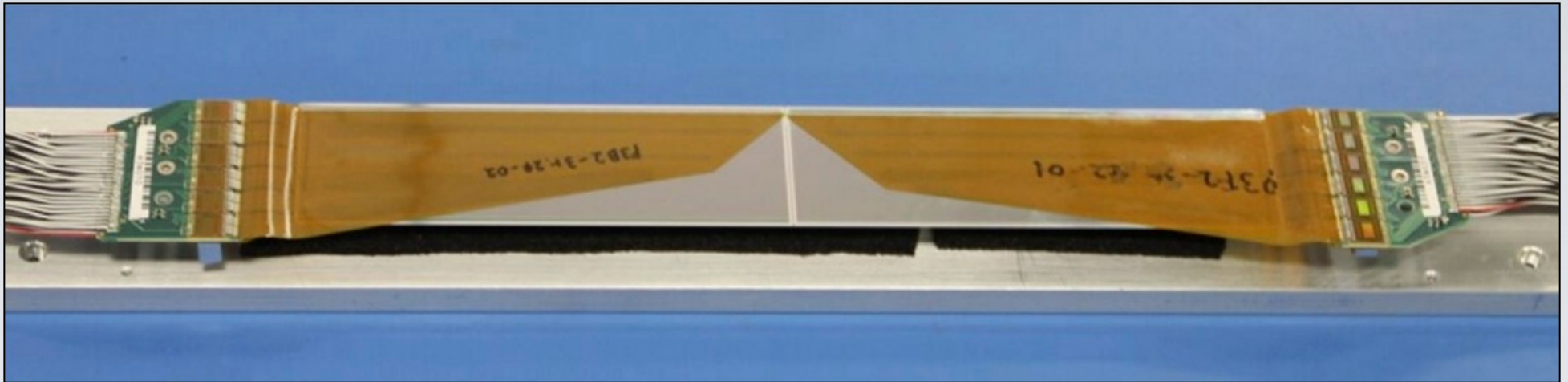


- ◆ Up to now, we are the only site that has started with mass production, so all produced sub-assemblies are stored in Pisa waiting to be shipped to the ladder assembly sites.



L3 status - Melbourne

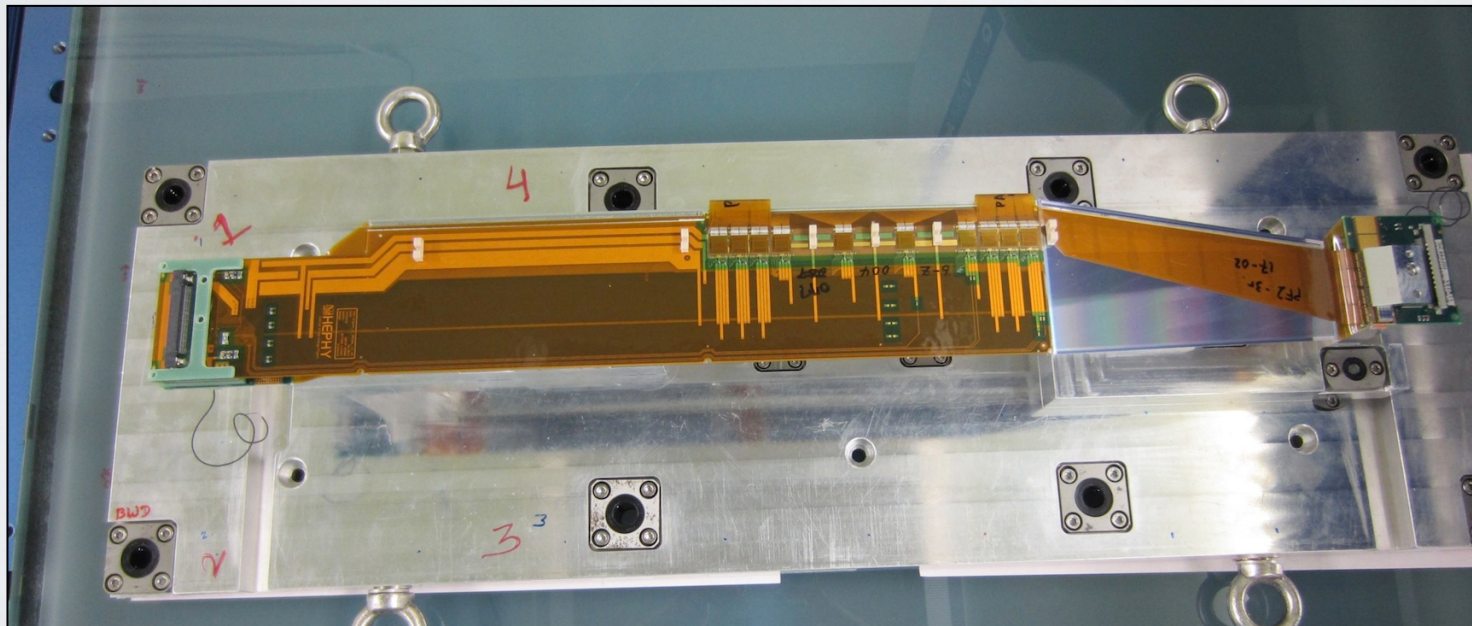
- ◆ 7 + 2 ladders to be produced
- ◆ CBQ was held on october 29th, after the assembly of two class B ladders



- ◆ In principle it was possible to start with class A production in november, but it was necessary to wait for Keratherm issue.
- ◆ After decision of capacitor replacement, some modifications were needed on the FW/BW bridges, to increas the distance between L3 and PXD
- ◆ Modifications have been set up and discussed last week
- ◆ An additional class C with modified pieces will be produced before starting with class A production next year.
- ◆ Production will take, according to schedule, up to four months.

L4 status - TIFR

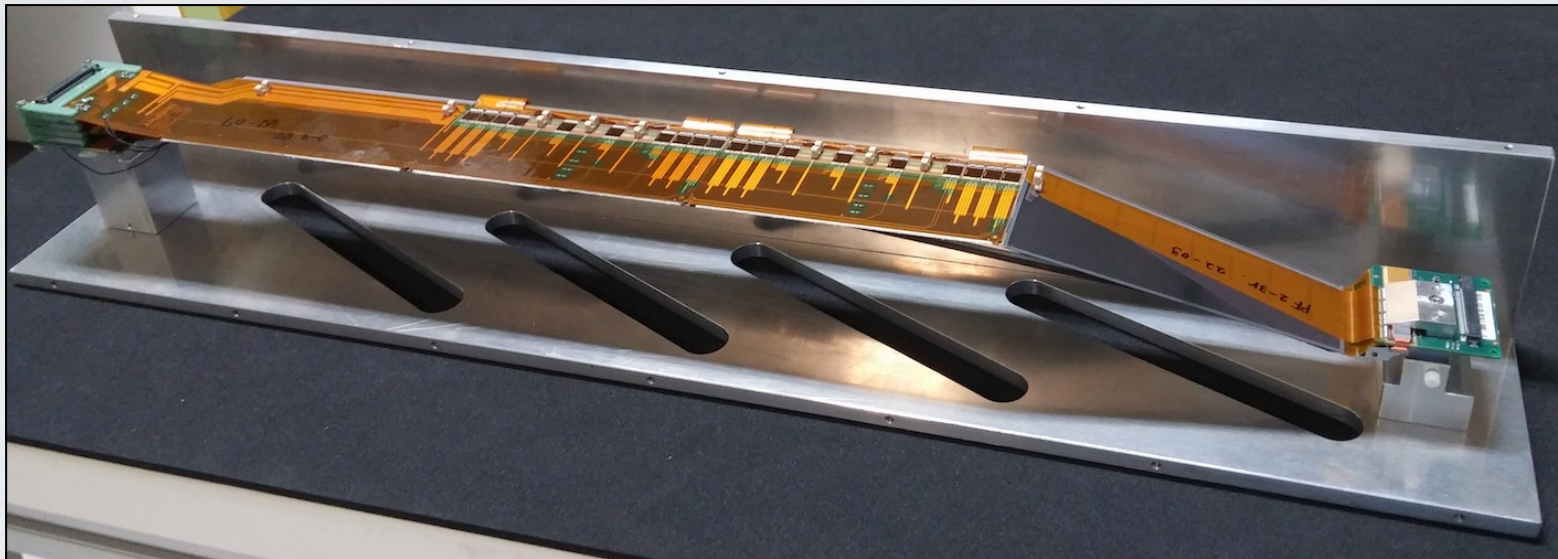
- ◆ 10 + 2 ladders to be produced
- ◆ First class B ladder assembled:
 - ◆ SFW shift by almost 1 mm in x-y plane, solved in the next class C ladder
 - ◆ SFW bowing after the assembly, under study
- ◆ Second class B to be produced, waited for common issues to be solved, in the meanwhile some improvements were developed:
 - ◆ production database usage
 - ◆ EQA improvement on the usage of aDefectFinder



- ◆ CBQ is scheduled for feb 6th, just after the next B2GM, then production can start if there will be no further QCG recommendations
- ◆ Production will require 12 months

L5 status - HEPHY

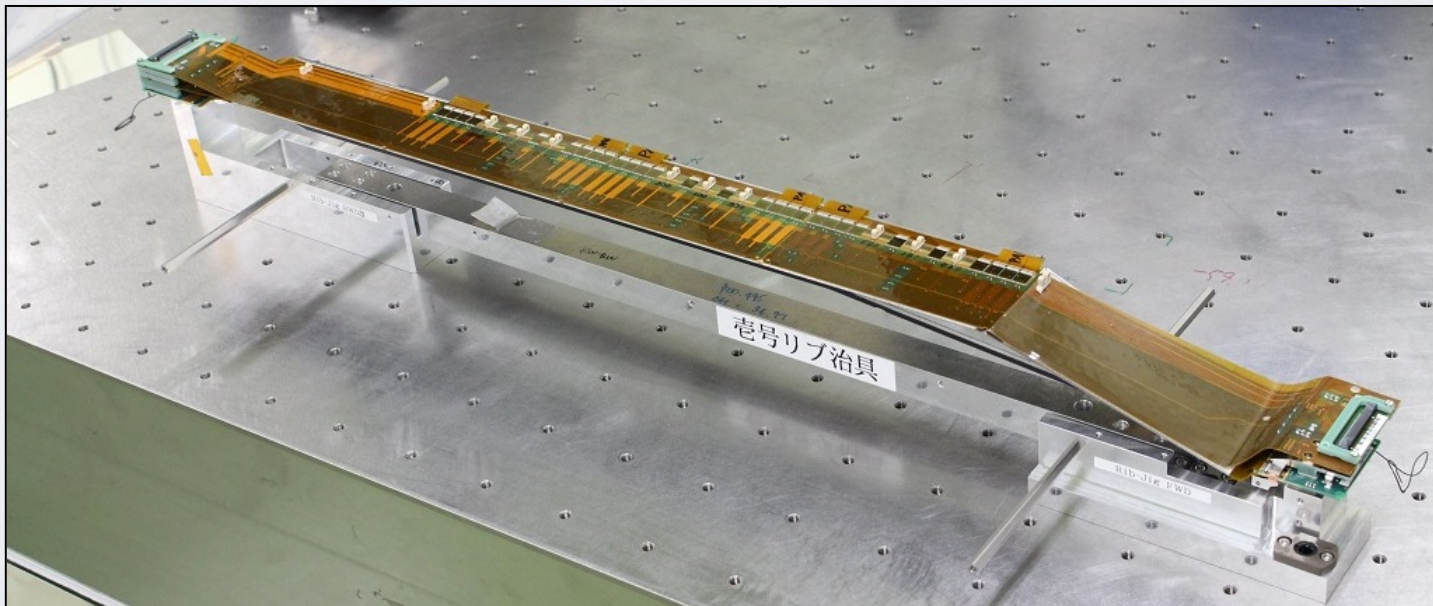
- ◆ 12 + 3 ladders to be produced
- ◆ CBQ was held on august 6th after the assembly of two class B ladders.
- ◆ L5.001, the class B+, was the first electrically working ladder with final components assembled in the whole SVD group.



- ◆ They are ready to start with class A production, waiting for common issues to be solved.
- ◆ Production will require 12 months.

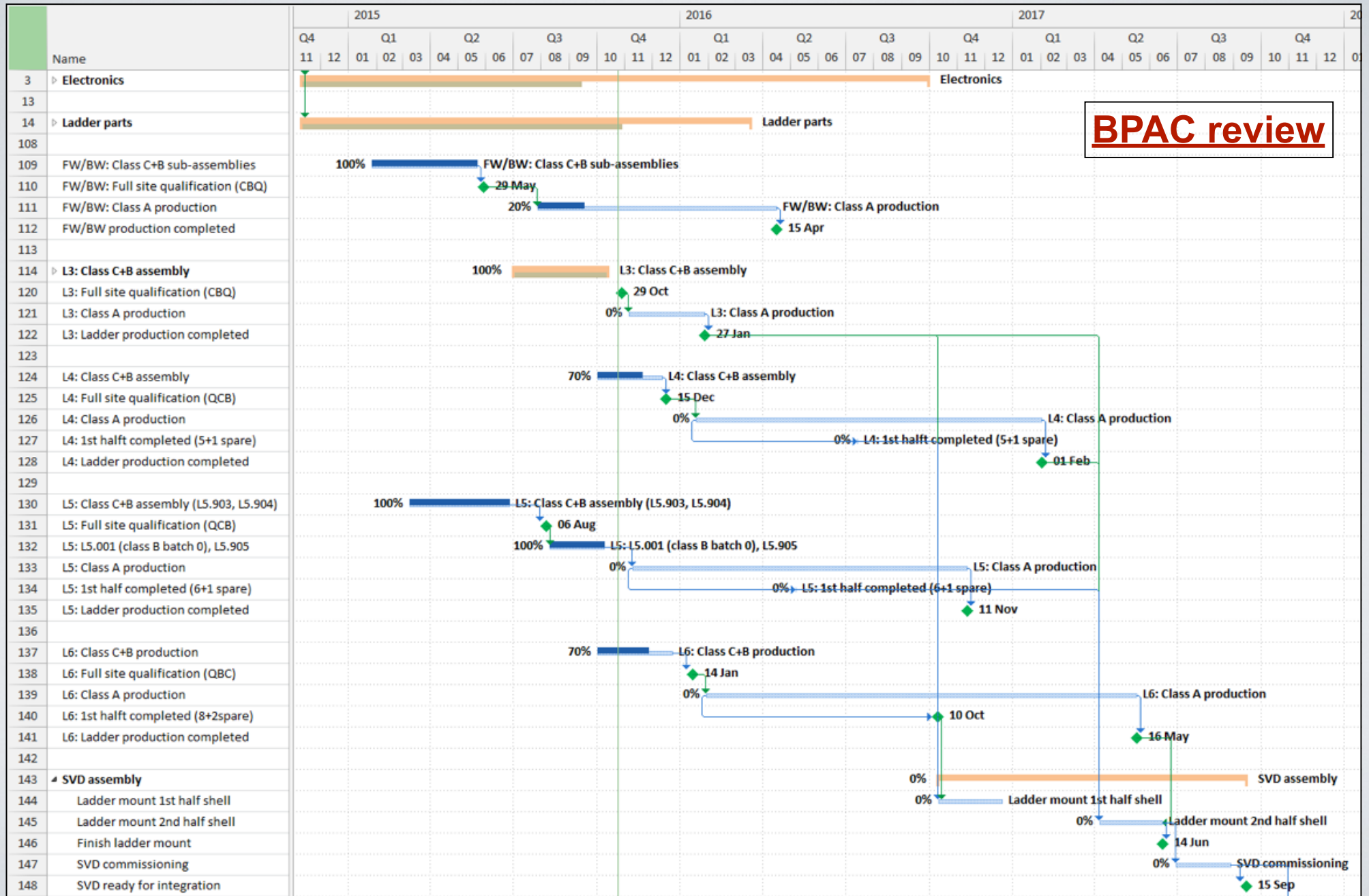
L6 status - IPMU

- ◆ 16 + 4 ladders to be produced
- ◆ First class B ladder assembled:
 - ◆ SFW shift in x-y plane and bowing, not completely solved, under study
 - ◆ Problems also with PA1 and PA2 wrapping: glue over PA pads. Studied and probably solved, now under verification with a class D ladder.
- ◆ Next class B ladder will be produced between jan and feb 2016 to verify:
 - ◆ production database usage
 - ◆ EQA improvement on the usage of aDefectFinder
- ◆ Manpower problem: possibility of hiring people under investigation.



- ◆ CBQ foreseen at the end of feb 2016
- ◆ Production will require 16-18 months

Overall schedules



BPAC review

Overall schedules

Schedule presented in the last BPAC review

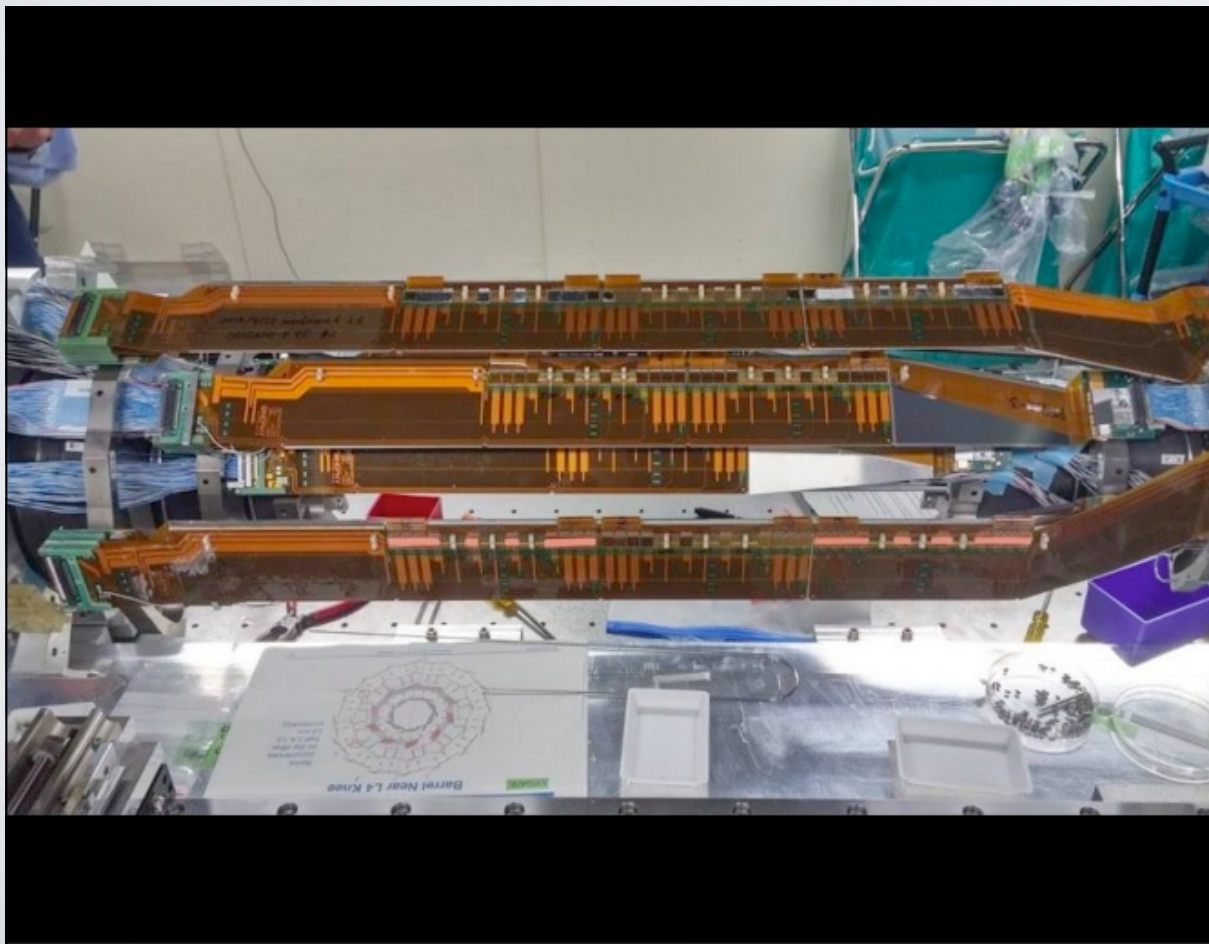
	2015						2016												2017											
	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
FW/BW																														
L3																														
L4																														
L5																														
L6																														
Ladder mount																														

Schedules will be delayed for some reasons:

- ◆ L3: mechanical modification of bridges (delay not critical).
- ◆ Keratherm issue took almost 2 months to be solved.
- ◆ L4 and L6 readiness delayed and manpower problem for L6.
- ◆ ORIGAMI issue: next 1st batch of mass production probably not ready before march 2016.

Interference test

After the last B2GM, a so called “interference test” was done to verify possible interferences between ladders of different layers. 2 class C ladders of each layer from L3 to L6 were mounted on the end rings mockup, attaching also all cables to hybrid boards connectors. No interference was observed and indications on cable routing were obtained.



Belle II Collaboration

"Mi piace" aggiunto alla Pagina · 9 dicembre ·

The Vertex Detector (VXD) system of Belle II is crucial for determining the vertex for short lived particles (with lifetimes of around a trillionth of a second). The Belle II VXD consists of two inner layers (layer 1 and 2) of a silicon pixel detector followed by four layers (layer 3 to 6) of a Silicon Vertex Detector (SVD), which is composed of silicon strips. Each layer of the SVD contains array... [Altro...](#)

Mi piace Commenta Condividi

Piace a te, [Giacomo De Pietro](#), [Giulia Casarosa](#) e altri 57.

4 condivisioni



Scrivi un commento...



Next - DESY testbeam

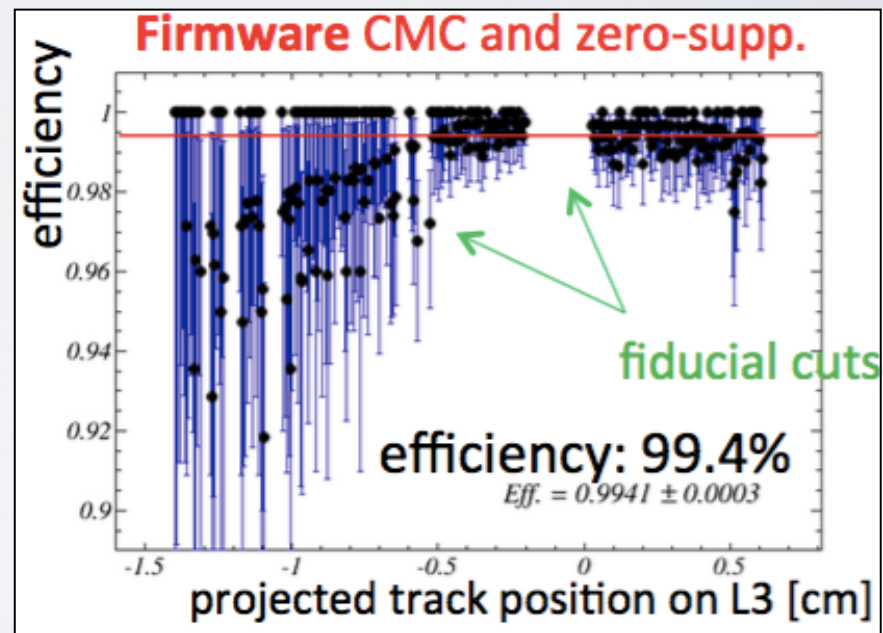
In april a testbeam is foreseen at DESY with both PXD and SVD.

The primary item is to see if both systems can be turned ON and operated together. But we would like also informations on the modules regarding efficiency and resolution.

A long time ago a study was done on the efficiency of L3, but no other data are available on the efficiency.

People involved from Pisa:

- G. Casarosa
- T. Lueck (now working on resolution)
- E. Paoloni





THANKS

