

Mechanics Group @ DPNC



- Highlights on projects in 2011
- Outlooks on 2012

« Workshop & Clean room » activities

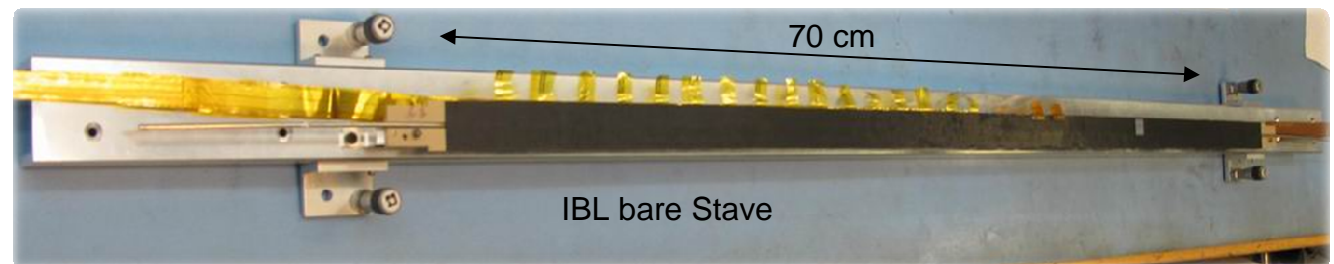
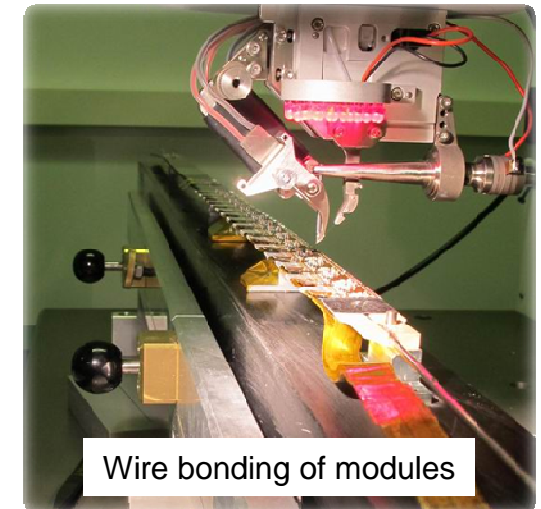
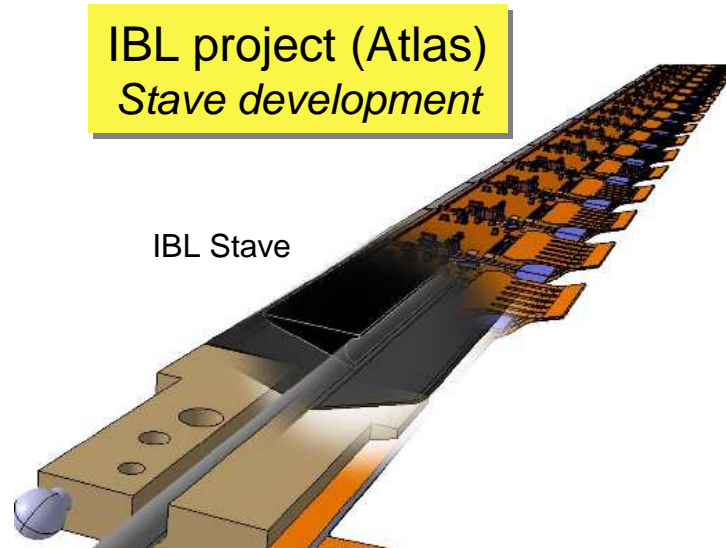
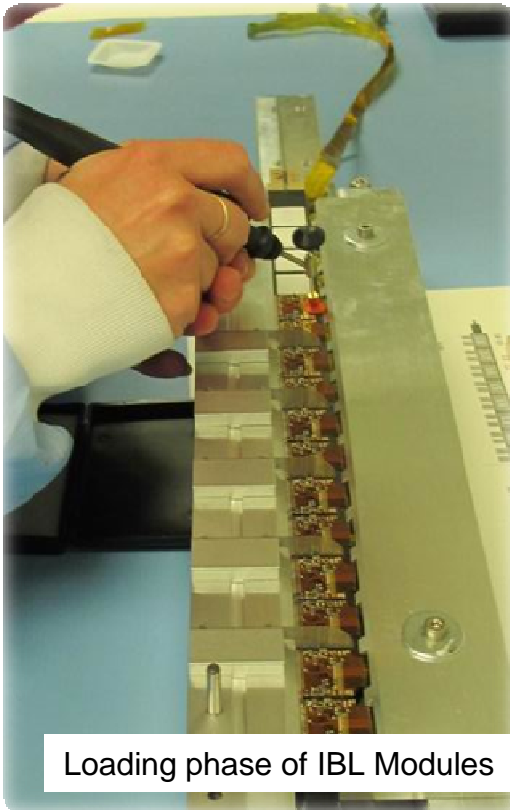
**Coralie,
Laurent,
Maarten,
Reynald**

« Mechanical Design & Development »

**Florian,
Gérard,
Laurent, and Maarten in overlap with Workshop activities
Franck (head of the group)**

**... don't forget Catherine, Peggy, Liliane, Nathalie, Marie-Anne,
our "central" workshops, and Yann !**

a big THANKS to all of you!

**UNIGE responsibility:**

- Module loading on Staves... The whole process has been validated this year (thru Prototypes)
- Design & manufacturing of the dedicated Loading tools
- **25 Staves to be equipped in 2012**, IBL installation to be completed in mid 2013
- Design & assembly of the Stave integration tool onto the Beam pipe (see next...)

IBL Project (Atlas)
Staves Integration / Beam pipe

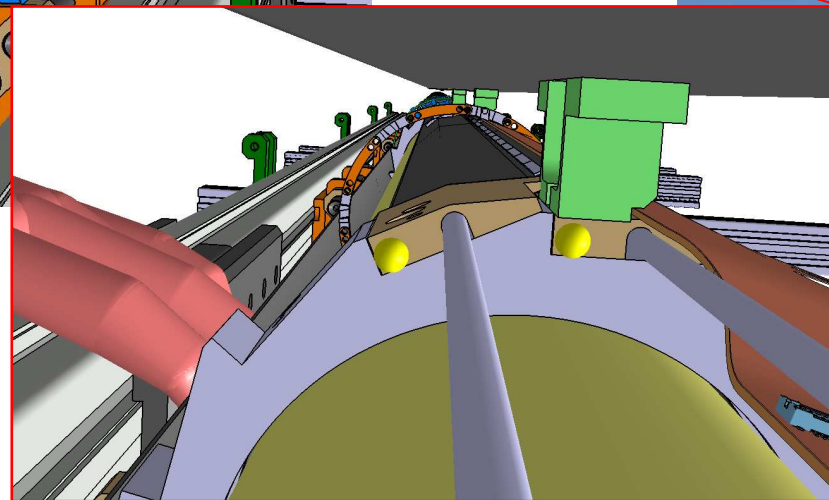
IST Tube in CFRP
(7m long, 85mm in diam., 0.5mm thick, in 3 parts.)

Only under good weather condition...

Beam Pipe

IBL_MPC

Prototype of the Multi Purpose Container (IBL_MPC), 1.6m long

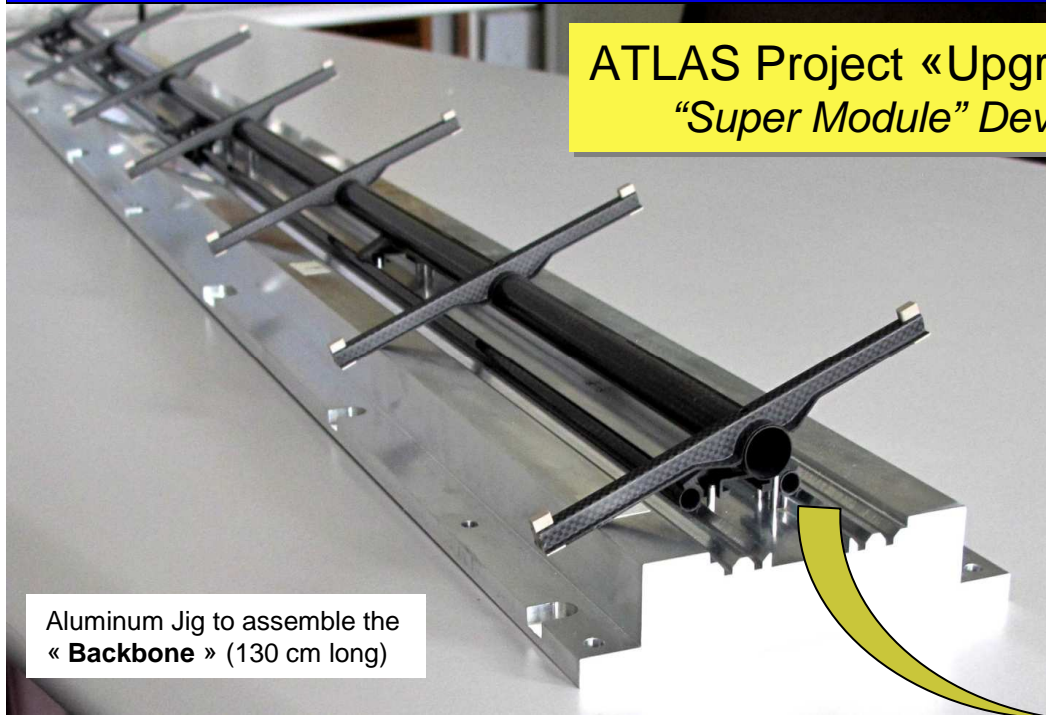


Longitudinal cutting of the IST

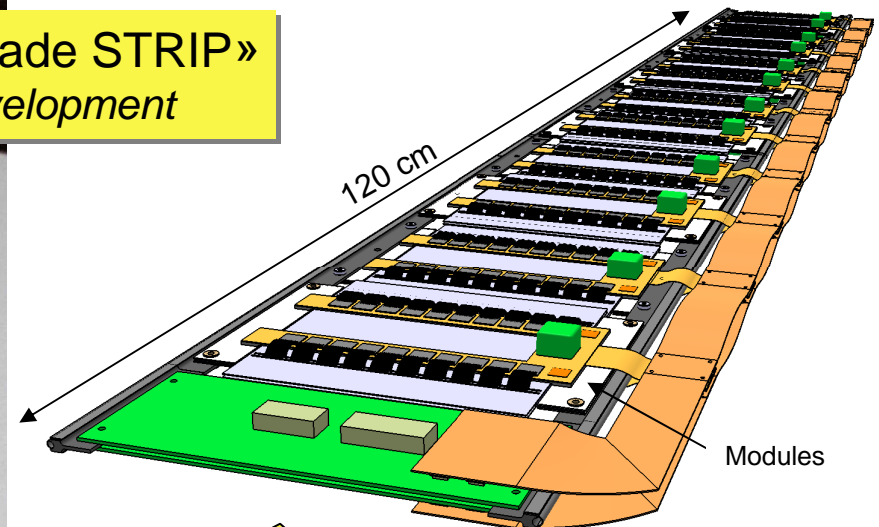
What is the challenge?

- Precise work on long structure (IST)
- Critical kinematics for Stave installation
- Multi purpose tool to be GARANTEED

ATLAS Project «Upgrade STRIP» “Super Module” Development



Aluminum Jig to assemble the
« **Backbone** » (130 cm long)



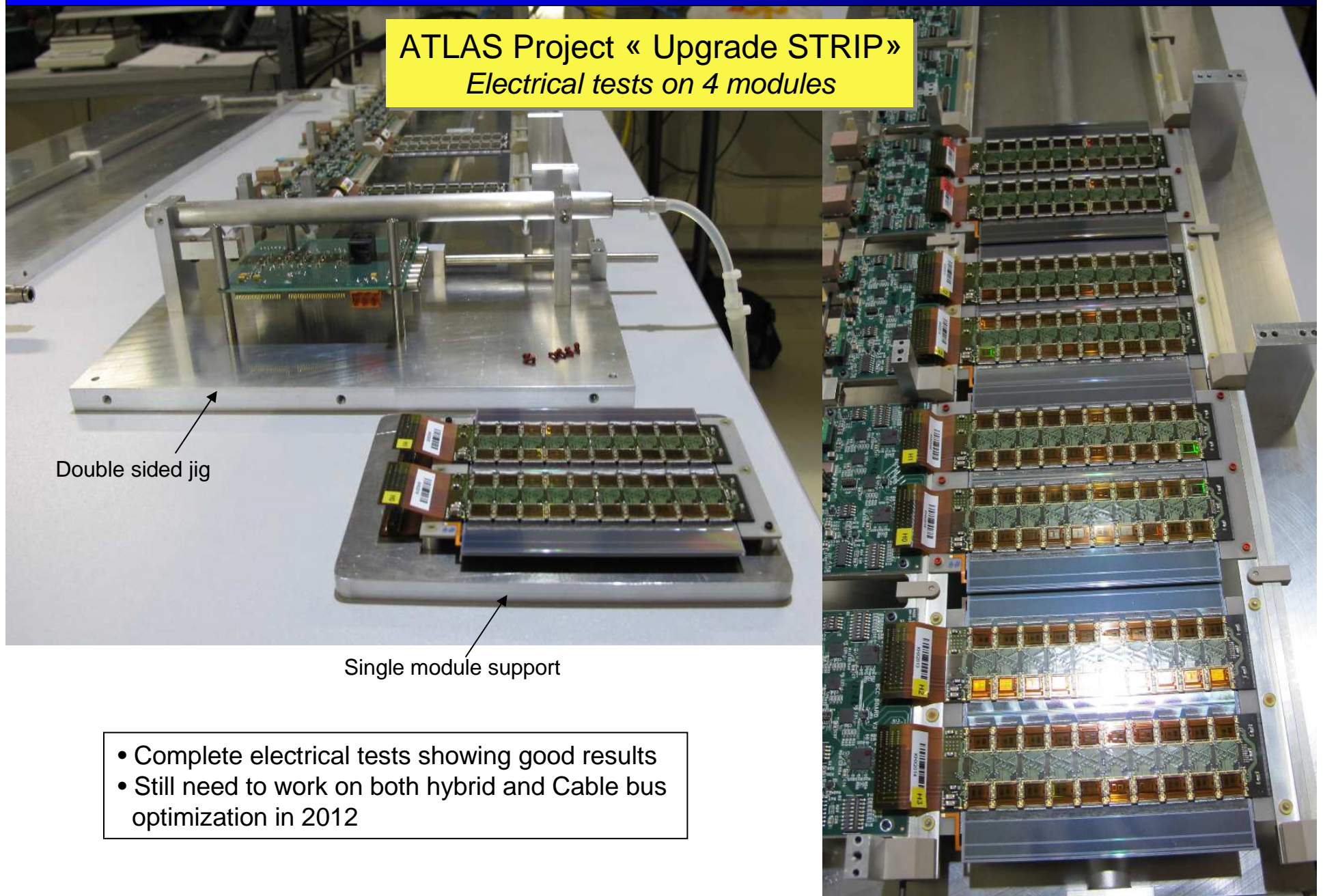
UNIGE commitment:

- 1 Full length prototype done and assembled with fake modules
- Material optimization performed on the “Back bone”
- End Insertion has been successfully shown
- Thermo elastic test to be done in 2012

20 « **Cross Beam** » pieces processed
@ Composite Design (Lausanne)

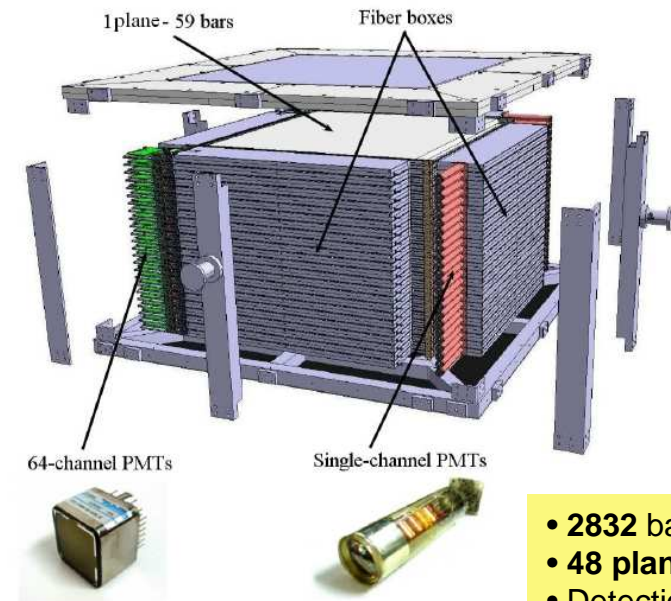
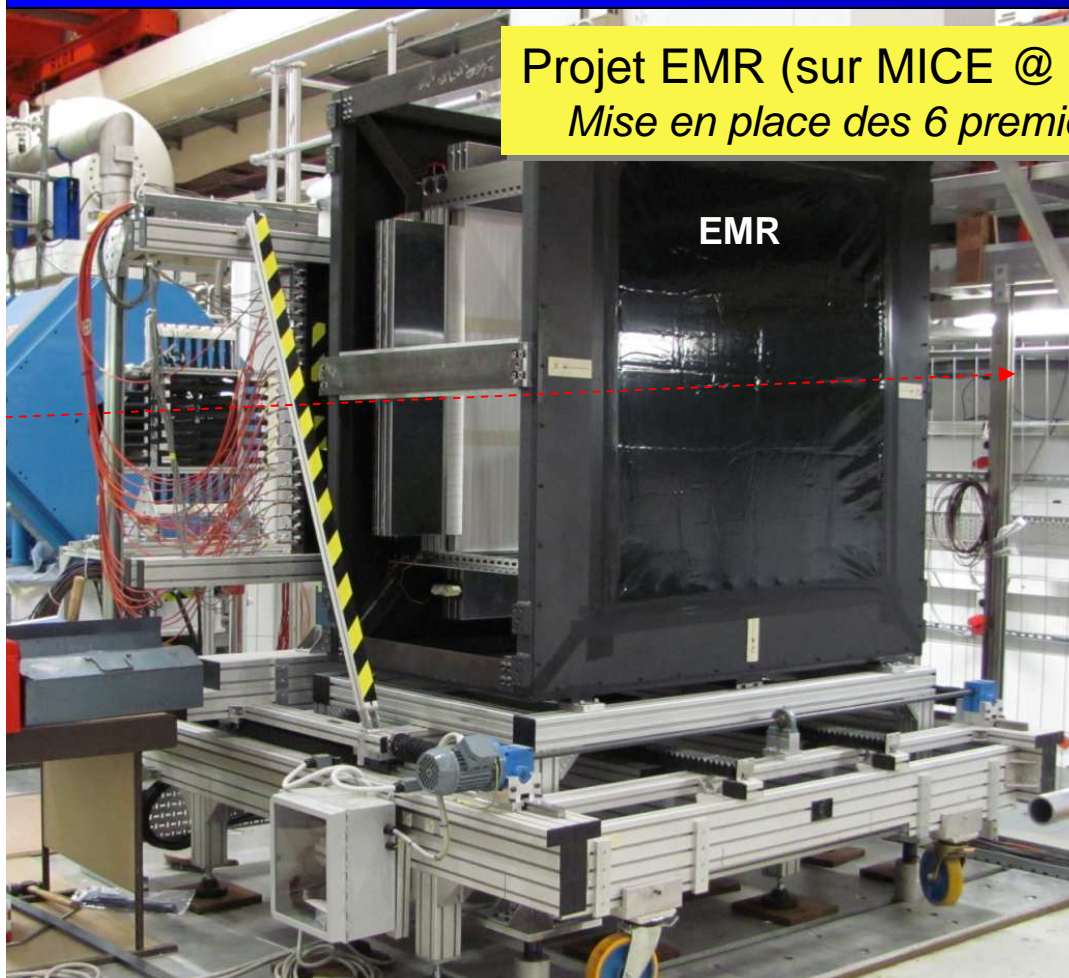


ATLAS Project « Upgrade STRIP »
Electrical tests on 4 modules

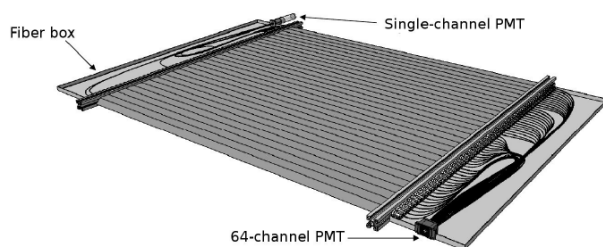


- Complete electrical tests showing good results
- Still need to work on both hybrid and Cable bus optimization in 2012

Projet EMR (sur MICE @ Rutherford Appelton Lab)
Mise en place des 6 premiers « plans » en Juin 2011



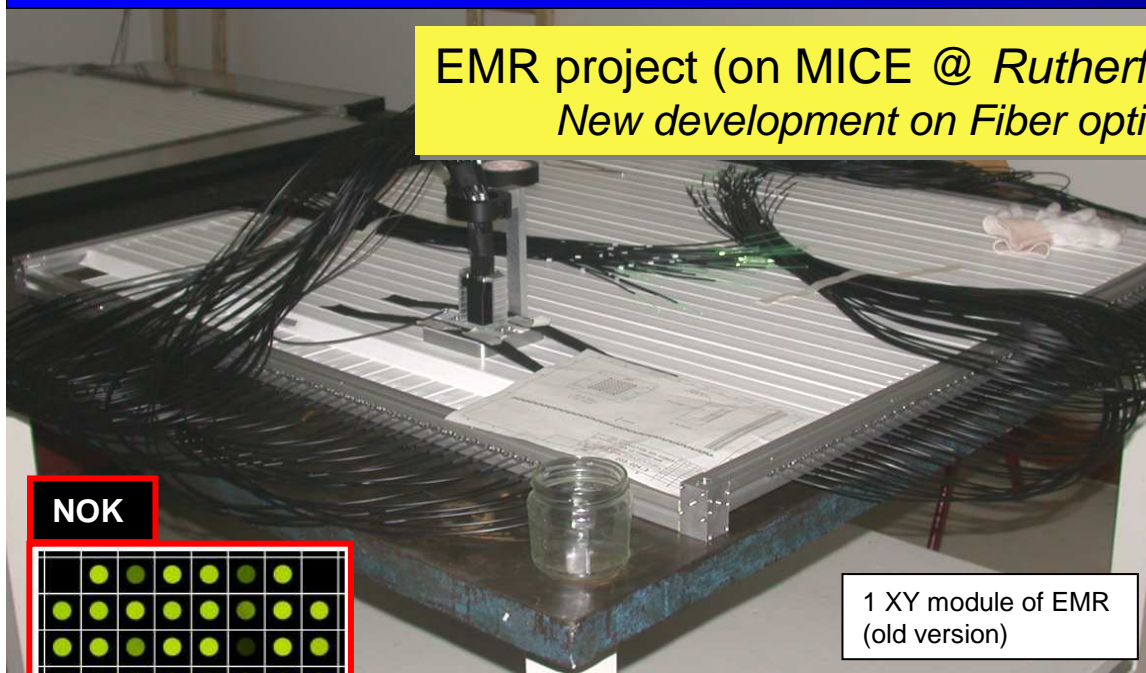
- 2832 bars,
- 48 planes
- Detection vol.: 1m x1m x80cm



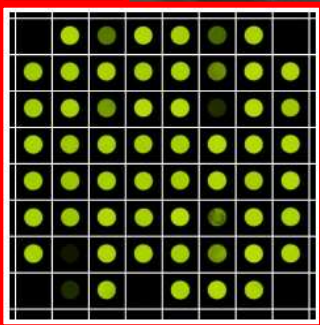
2011 status:

- Electrical and DAQ tests on 3 modules (6 planes, X and Y)
- BUT: Dead channels on most of the planes (10% of losses)
- **Led to new developments** on fiber optics connectors (of interest for future Neutrinos projects!)... see next!

EMR project (on MICE @ Rutherford Appelton Lab)
New development on Fiber optics connectors

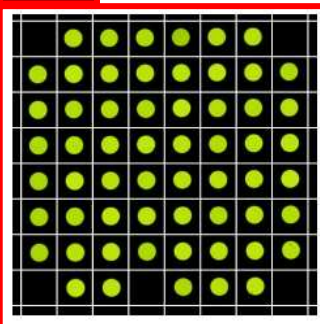


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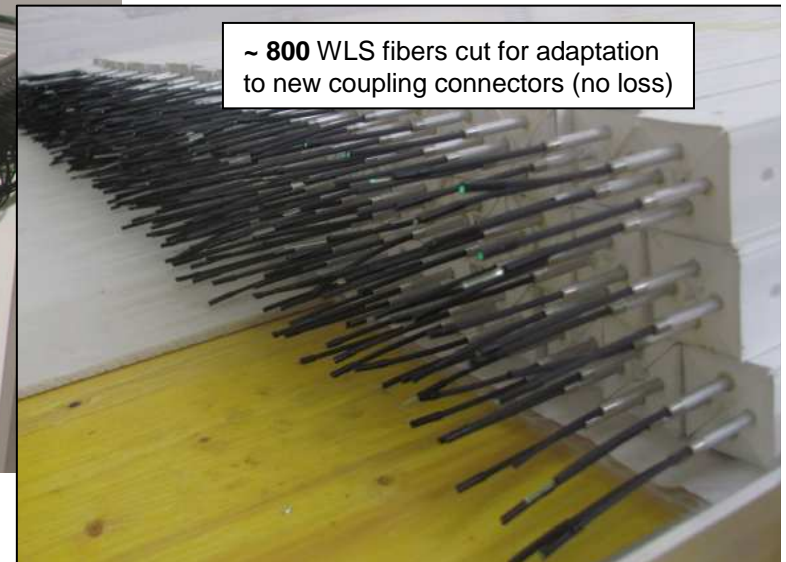


Scanning of fiber ends
@ multi PMT level

OK

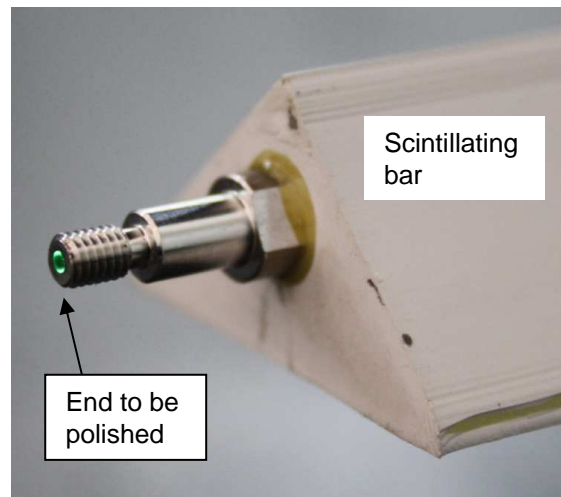


1 XY module of EMR
(old version)



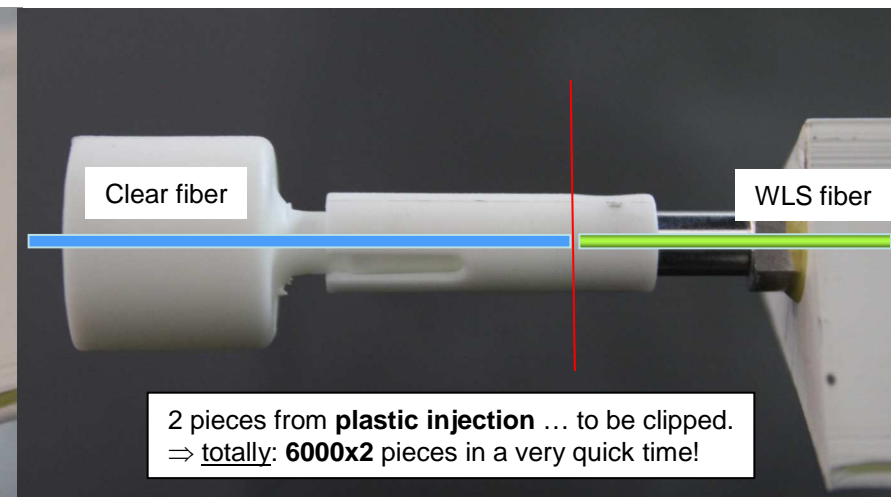
~ 800 WLS fibers cut for adaptation
to new coupling connectors (no loss)

Ongoing development (also in view of the “future of Neutrinos”... coupling with SiPMT??)
Coupling of WLS fiber vs Clear fiber



Scintillating
bar

End to be
polished



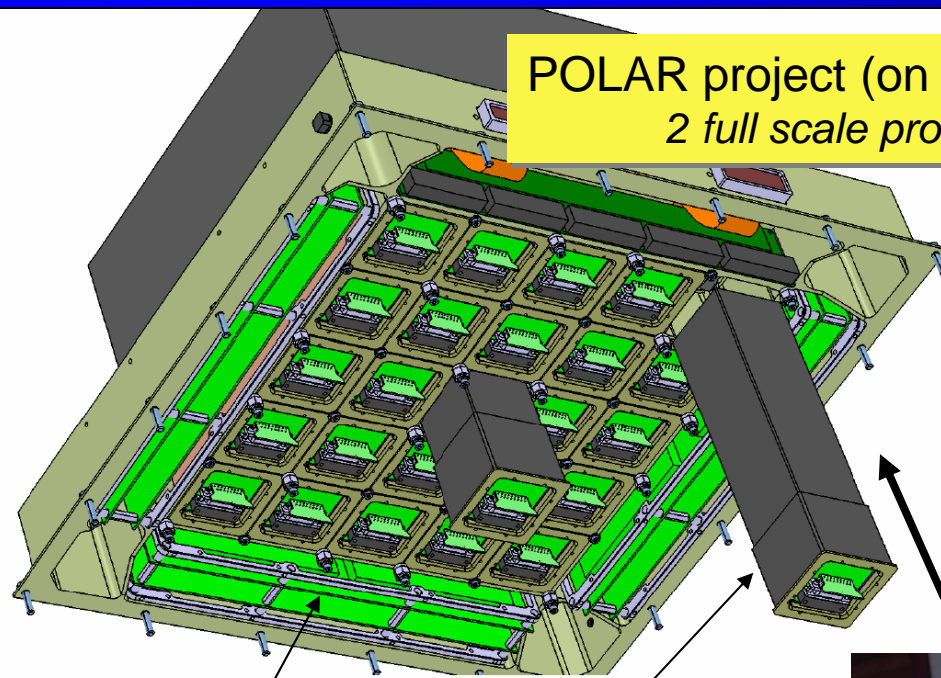
Clear fiber

WLS fiber

2 pieces from **plastic injection** ... to be clipped.
⇒ totally: **6000x2** pieces in a very quick time!

POLAR project (on TG#2, Chinese Space Station)
2 full scale prototypes delivered to DPNC

- Max envelope : **450x450x250 mm³**
- Max weight: **30 Kg**
- New bar length: 176mm (Prod. In Poland)
- R&D still ongoing on injection process
- Interfaces has been agreed with IHEP Beijing



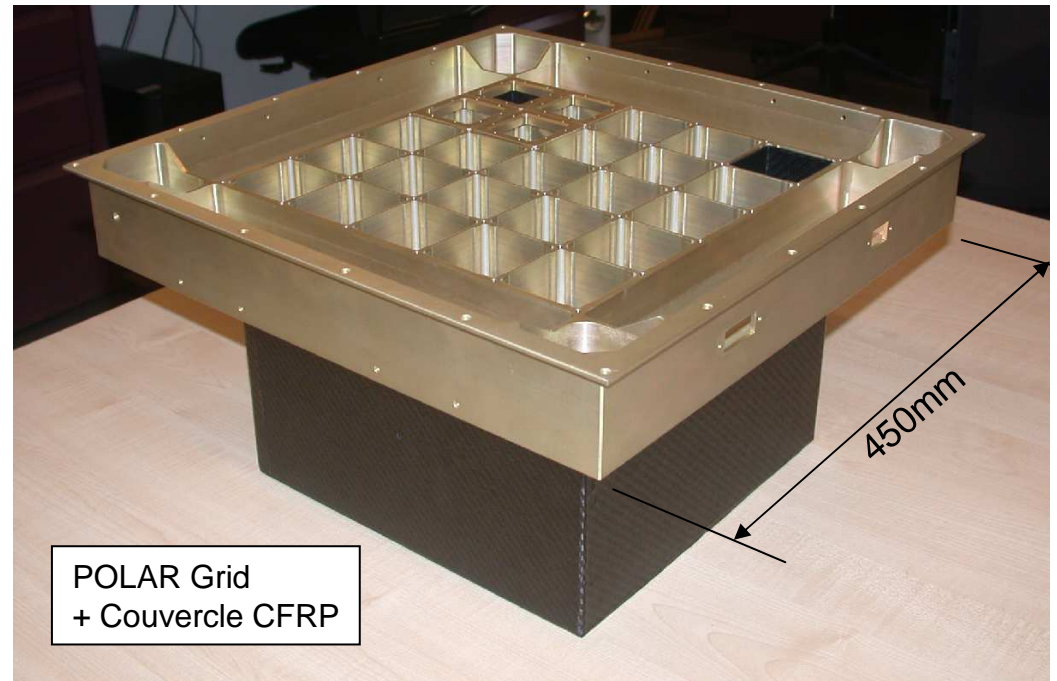
Electronic boards
housing

POLAR module

Scintillations Bar

PMT

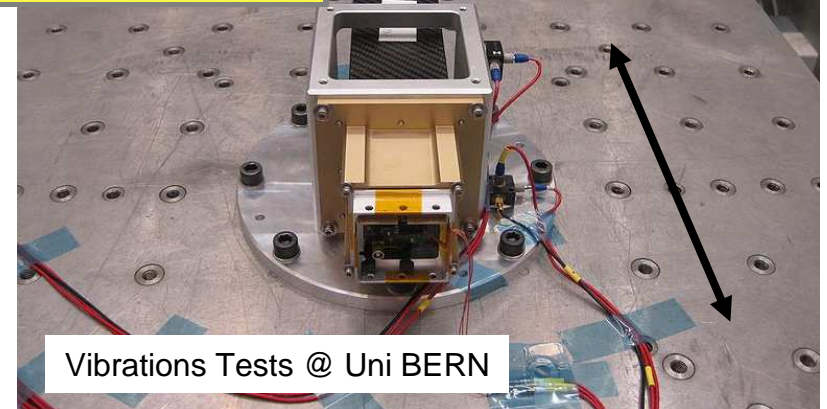
New FEE



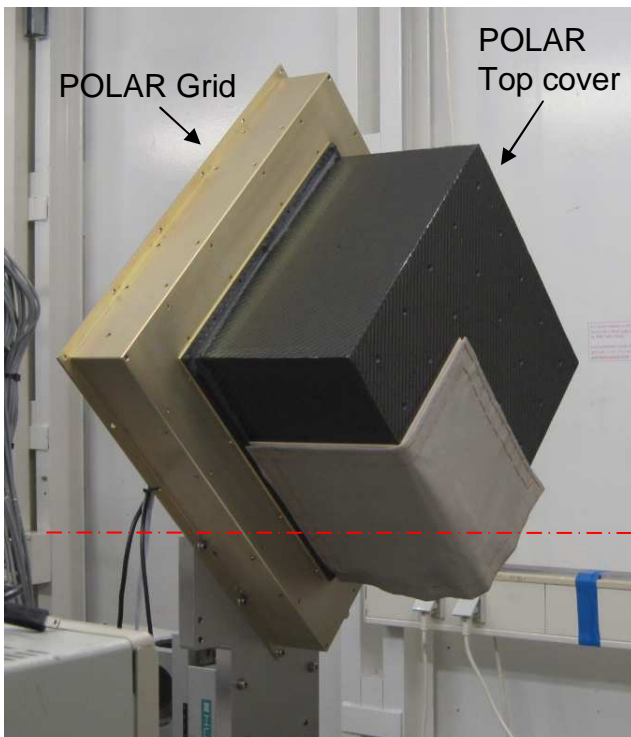
POLAR project

Space Qualification tests (on 1 module... OK)
Beam tests @ ESRF Grenoble (4 modules)

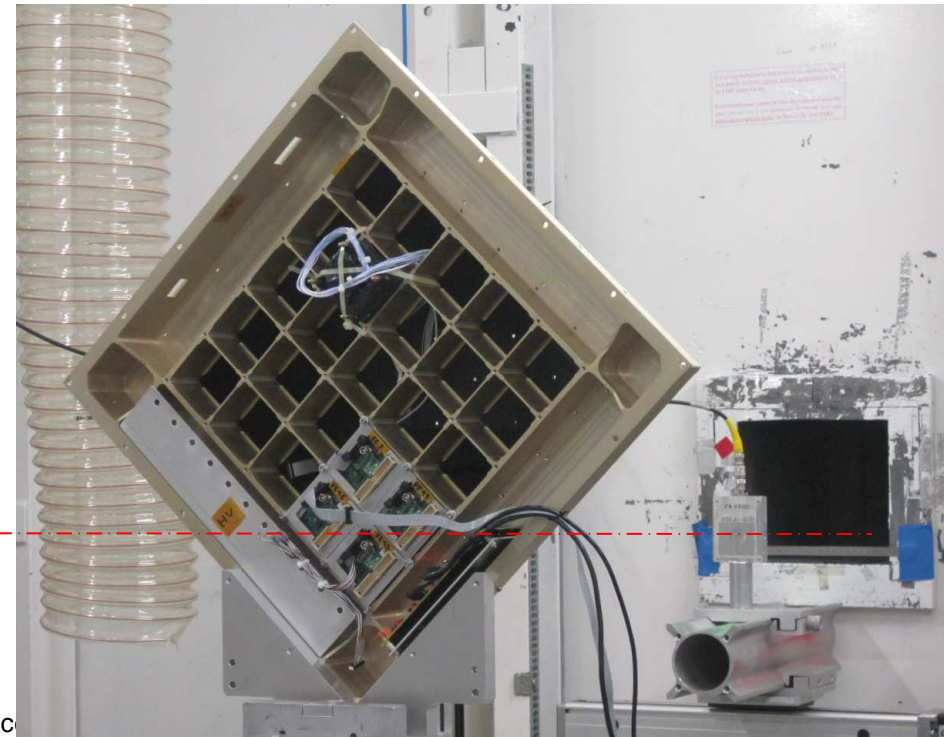
Thermo vacuum tests
in TERNI (Italy)



Vibrations Tests @ Uni BERN



ESRF Tests
(end of Nov. 2011)
 Several modules
 - 4 old FE,
 - 1 new FE
 - 1 IHEP module



*A few new projects in the pipeline... FACT (CTA?), next Neutrino, LOFT (?),...
But let's focus first on the current commitments: IBL, Super Modules, POLAR and EMR.*

A summary of the deadlines for 2012:

IBL:

- 25 Staves to be loaded with modules (starting in May-June)
- Fabrication and assembly of the tool to load staves onto Beam pipe (end of 2012)

EMR:

- a full detector with 48 planes to be delivered @ RAL in may 2012.

POLAR:

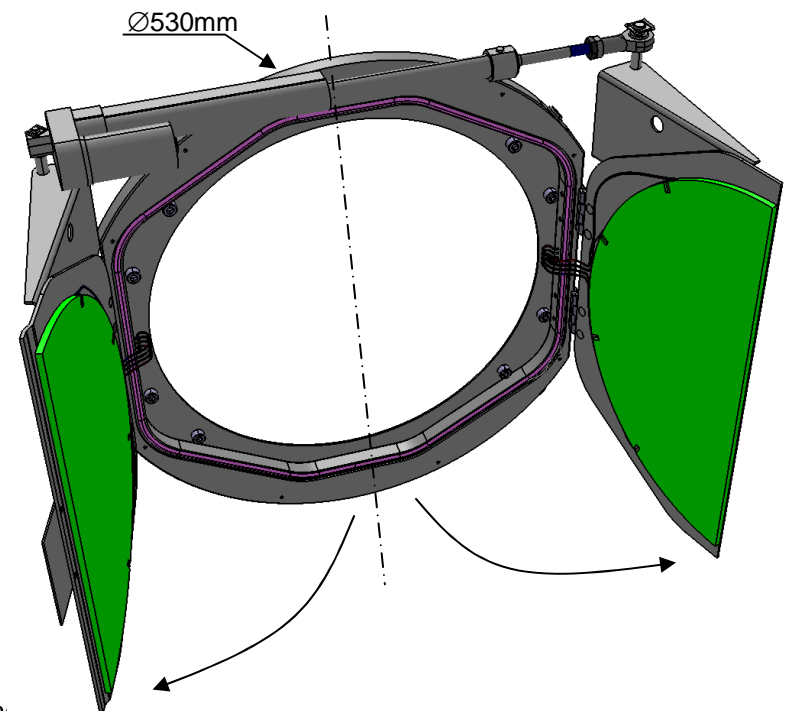
- Complete QM model (x2?) with 25 Modules and associated electronics to be delivered in Summer 2012

... **FACT** project under evaluation @ DPNC

(Prof. Teresa MONTARULI):

- Studies & developments around detection plane
- Modifications on the « **Shutter** »
(opening-closing mechanism)

⇒ Towards an extrapolation at a bigger scale
(CTA project) ?



***THANKS again and
merry Christmas!***

