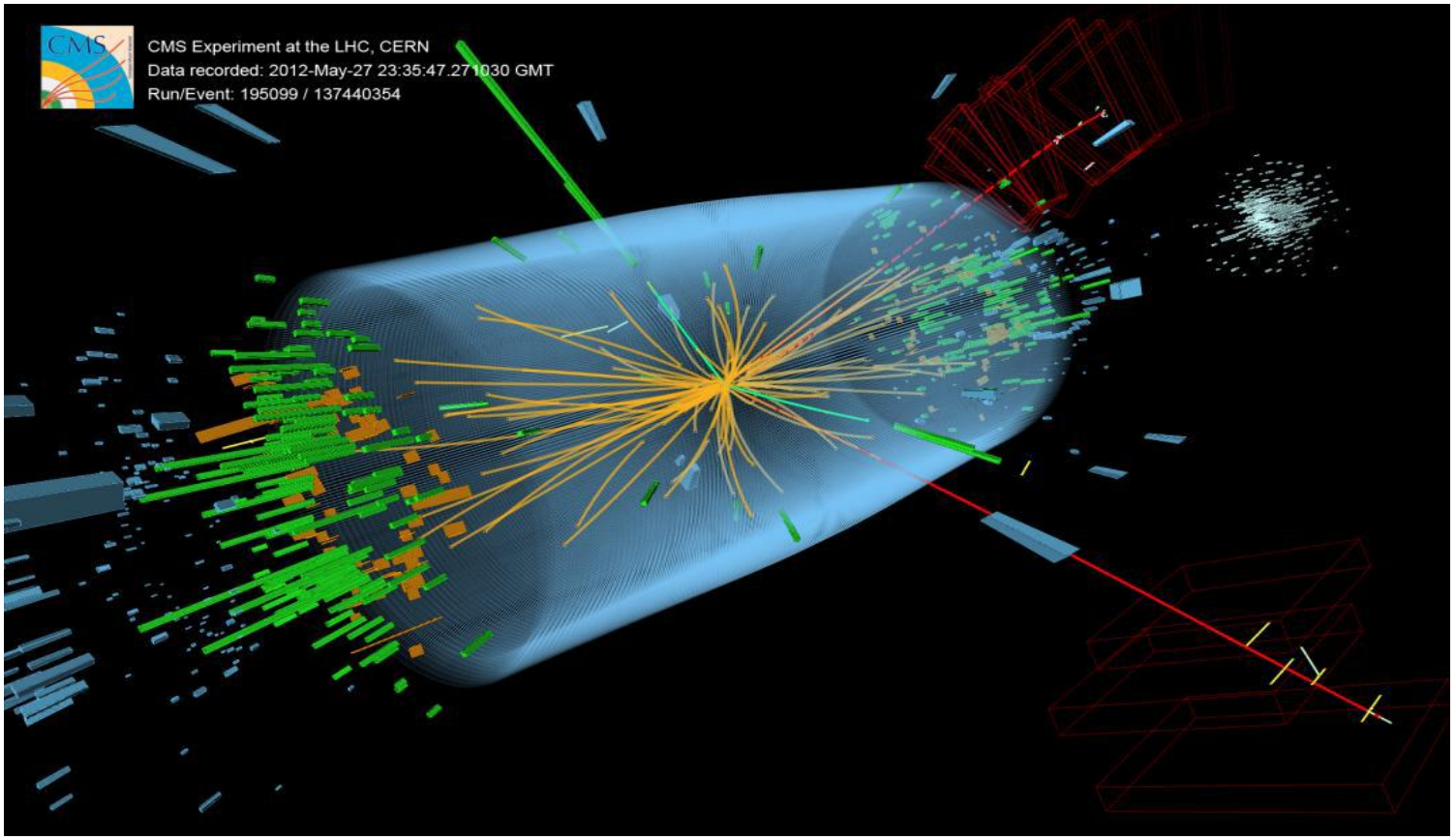
НАУЧНАЯ СЕССИЯ
ОТДЕЛЕНИЯ ФИЗИКИ ВЫСОКИХ ЭНЕРГИЙ
25 декабря 2012

Проект CMS в 2012

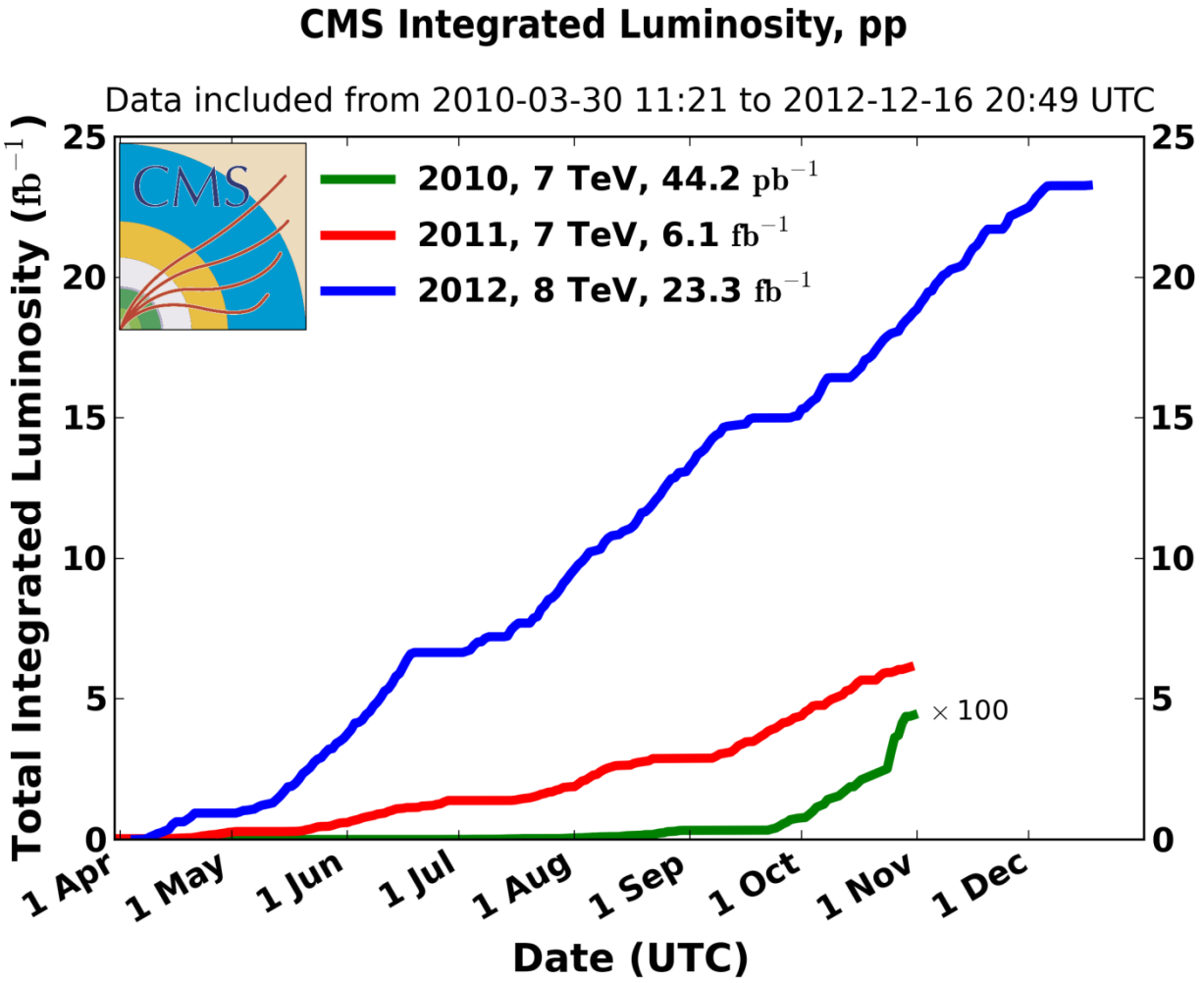
В.Сулимов

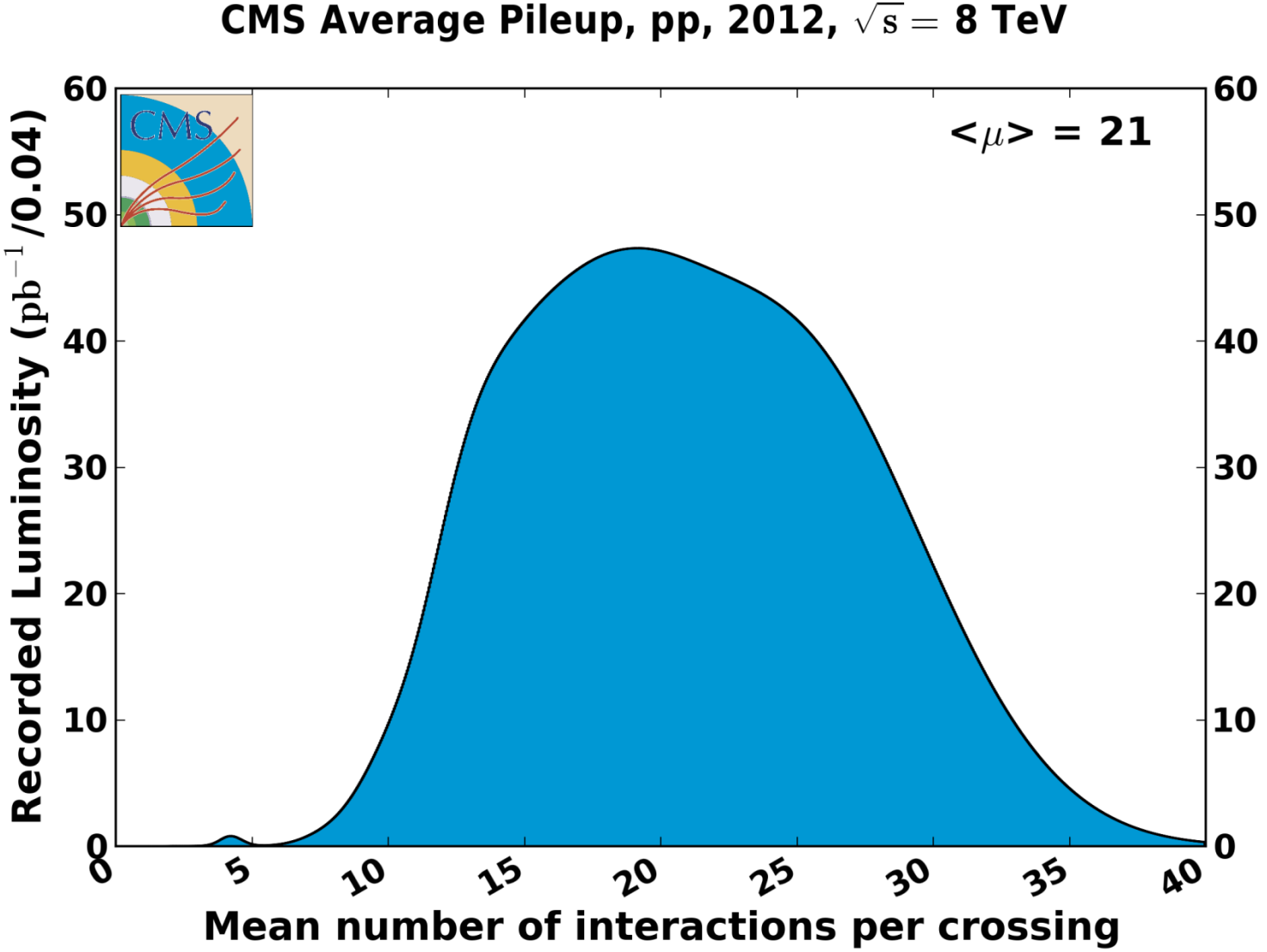
The CMS Collaboration

Observation of a New Particle with a Mass of 125 GeV

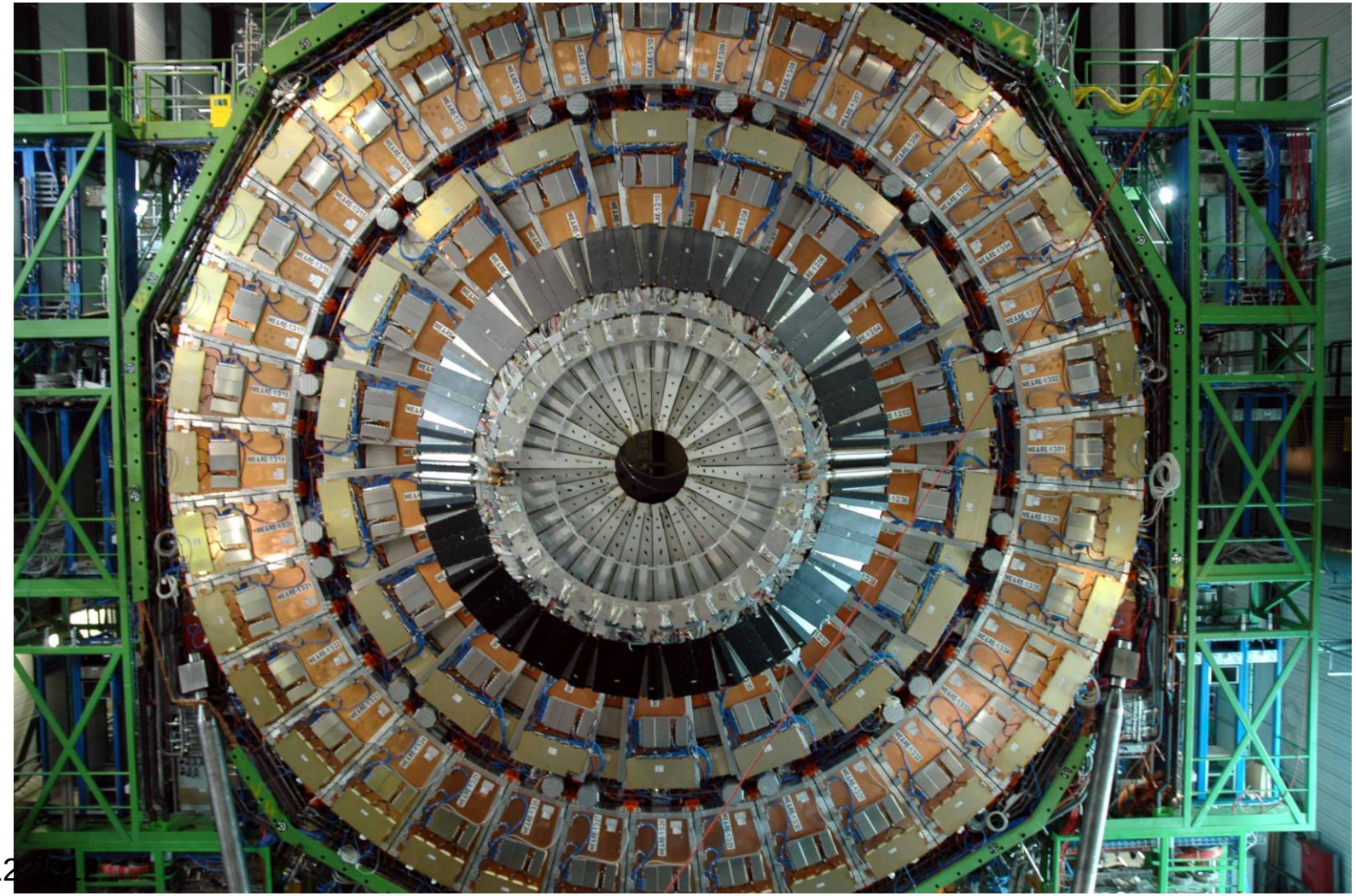


LHC Performance in 2010/12

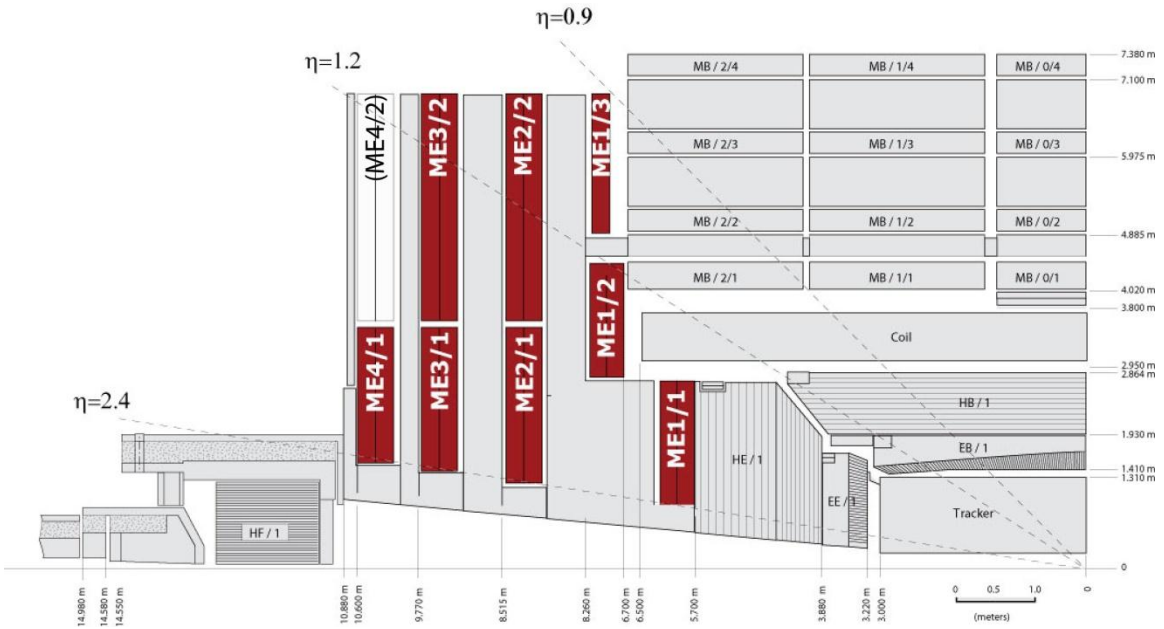



CMS Average Pileup, pp, 2012, $\sqrt{s} = 8$ TeV
CMS
<μ> = 21
Recorded Luminosity (pb^{-1}/0.04)
Mean number of interactions per crossing
0
10
20
30
40
50
60
5
15
25
35

Muon Subsystem

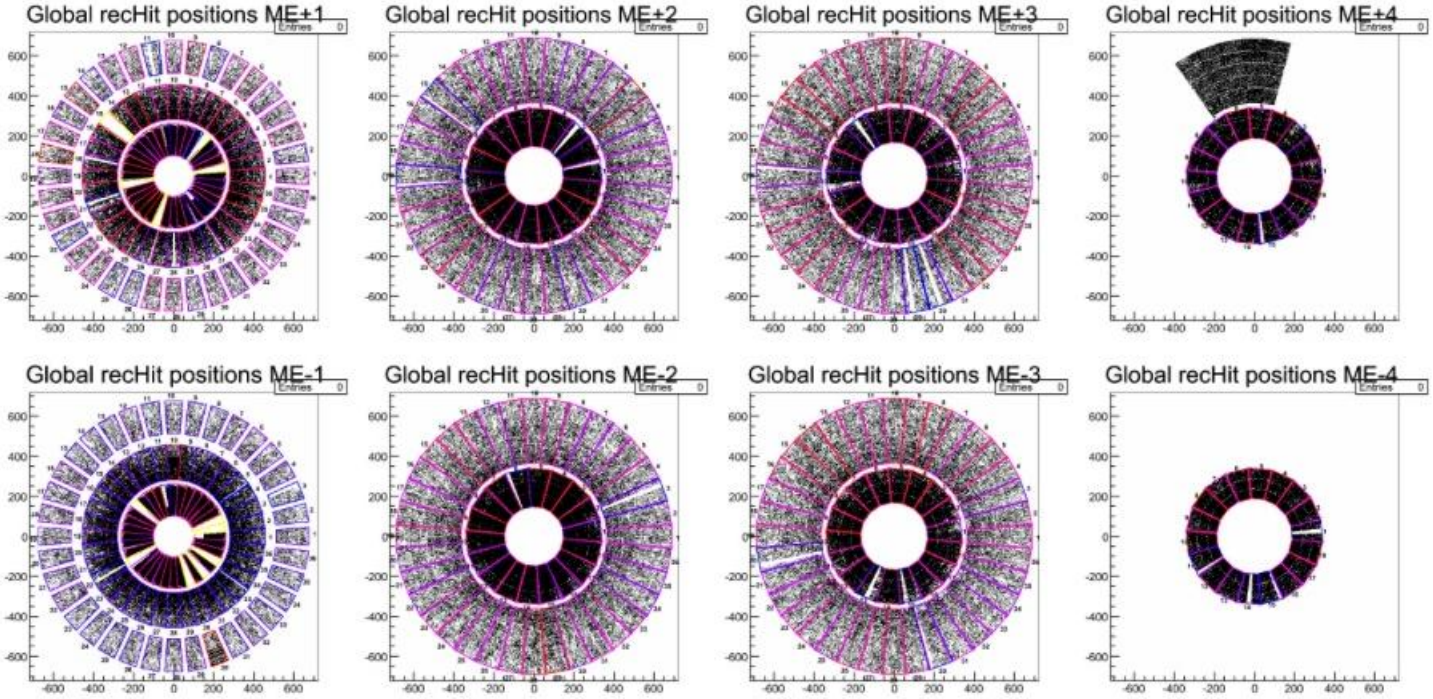


Status Muon Subsystem

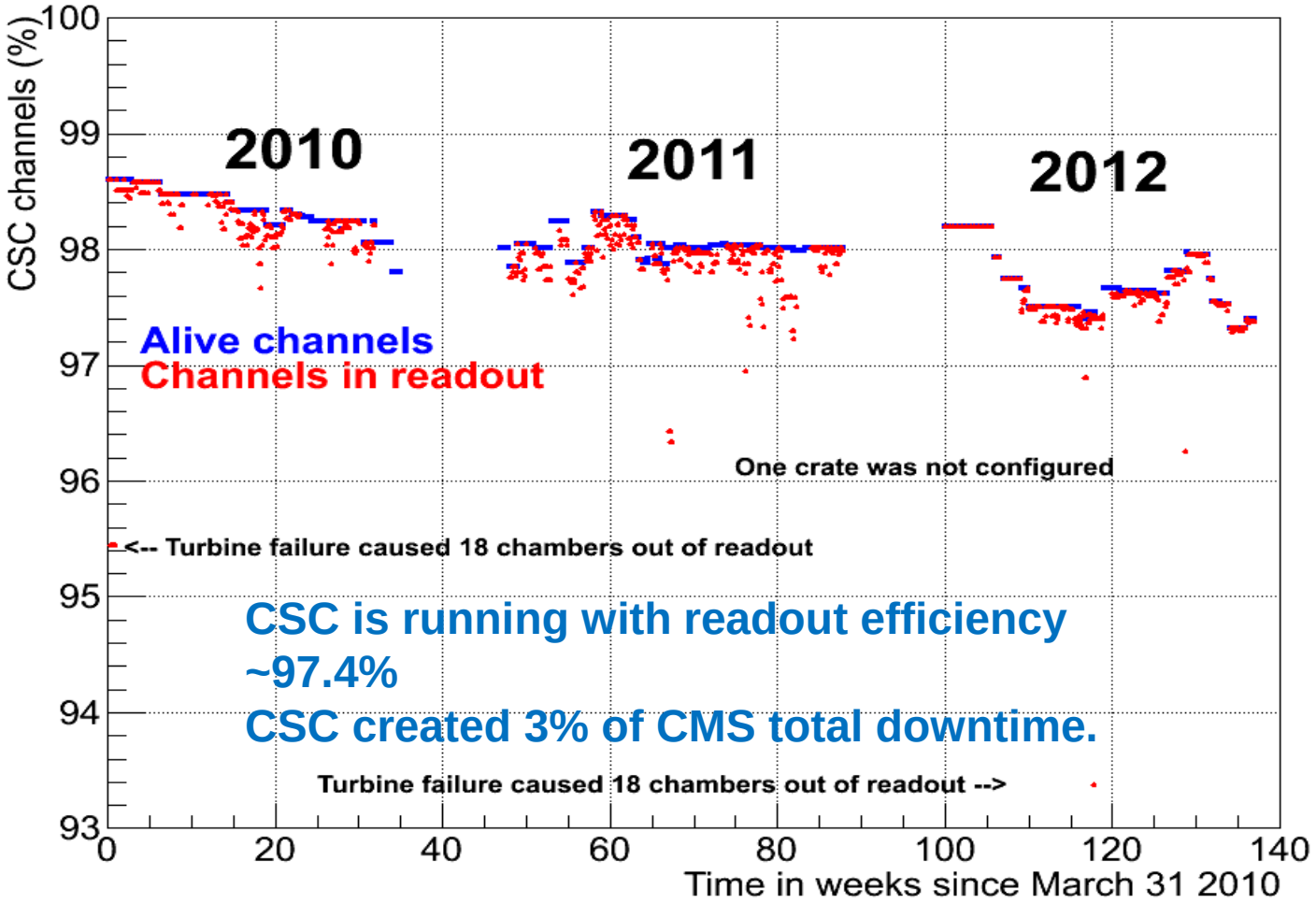


ME1/1 72 1.5×0.5 m²
ME1/2 72 1.6×0.8 m²
ME1/3 72 1.7×0.9m²
ME 2/1 36 1.9×1.25 m²
ME3/1 36 1.7×1.25 m²
ME4/1 36 1.5×1.25m²
ME23/2 144 3.2×1.3m²
ME4/2 5 3.2×1.3m²
473 CSCs (cover about 6000 m²)
2.3 10**6 anode wires
183168 anode readout channels
217728 cathode readout channels

CSC status at the end of LHC proton run



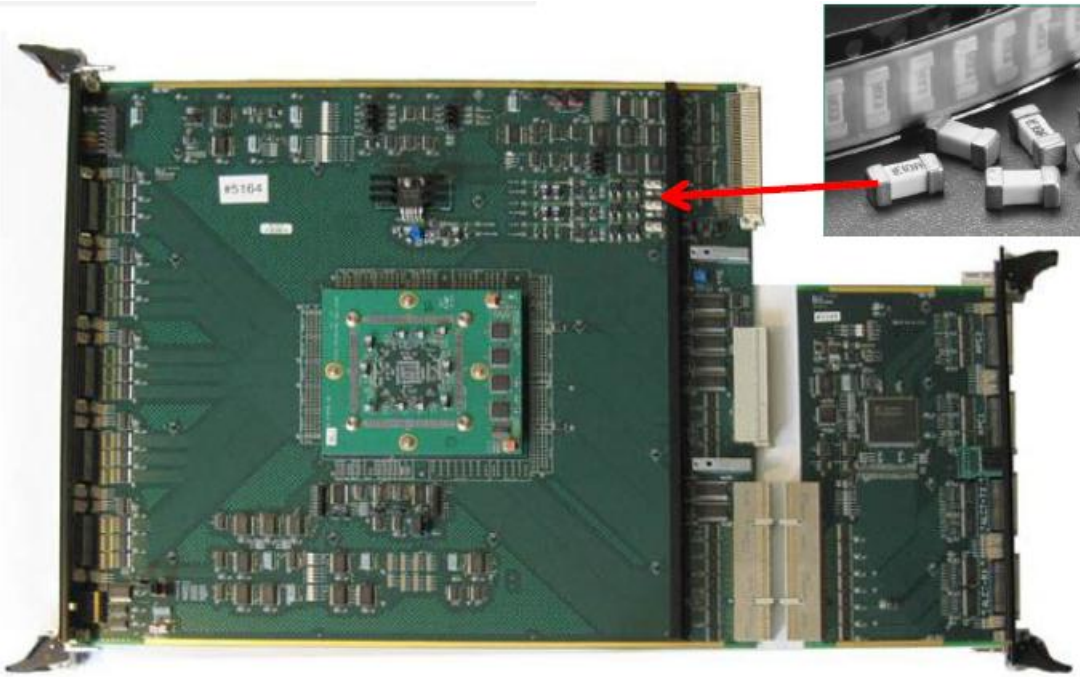
CSC real run efficiency

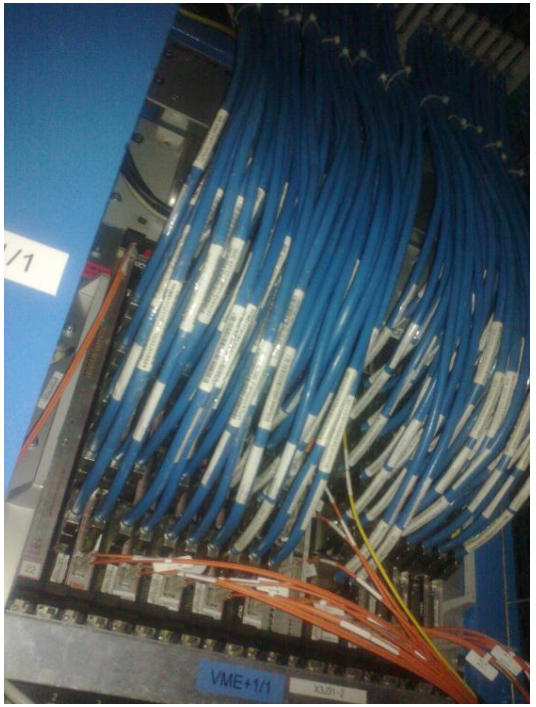


Preparation for stable running in 2012

- LV
  1. Replacing 3.3 V fuses on the TMB boards.
  2. Connectivity test of 7 V lead to the on-chamber electronics.
- HV
  1. Implement new protocol of the DCS- HV server communication.
  2. Increase threshold for HV current trips in the inner ME rings.
- EPROM reloading
  1. Automate EPROM downloading procedure.
  2. Test of an effect of regular refreshing of the EPROM contents.

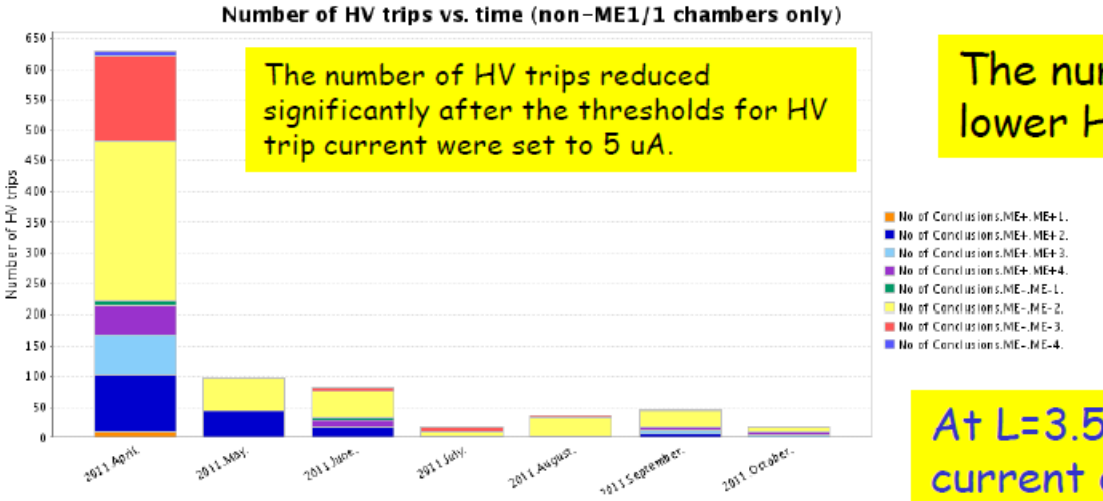
TMB fuses



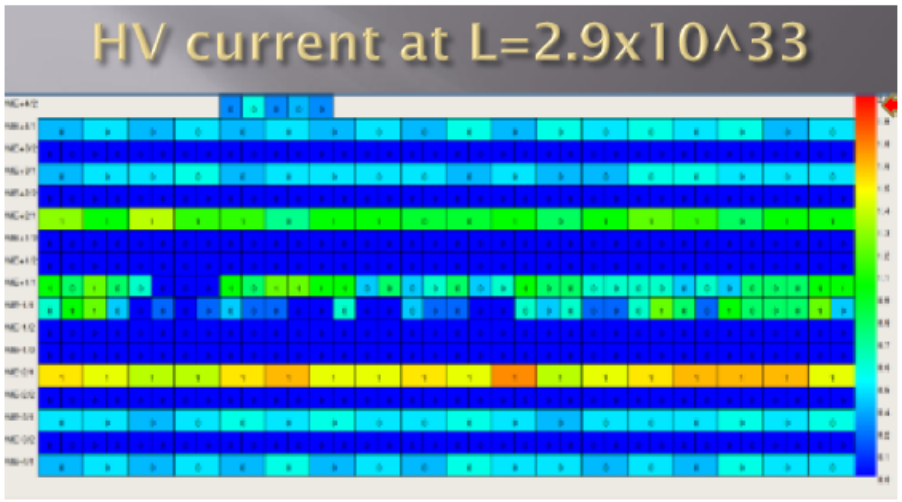


Silver plated 3.3 V fuses have been replaced by gold plated ones on 70 TMBs.
We didn't replaced the fuses on TMBs which have 3.3 V readings bigger than 3.16 V and where the access is blocked by 2 layers of skew clear cables.

CSC raises the threshold for HV trip current



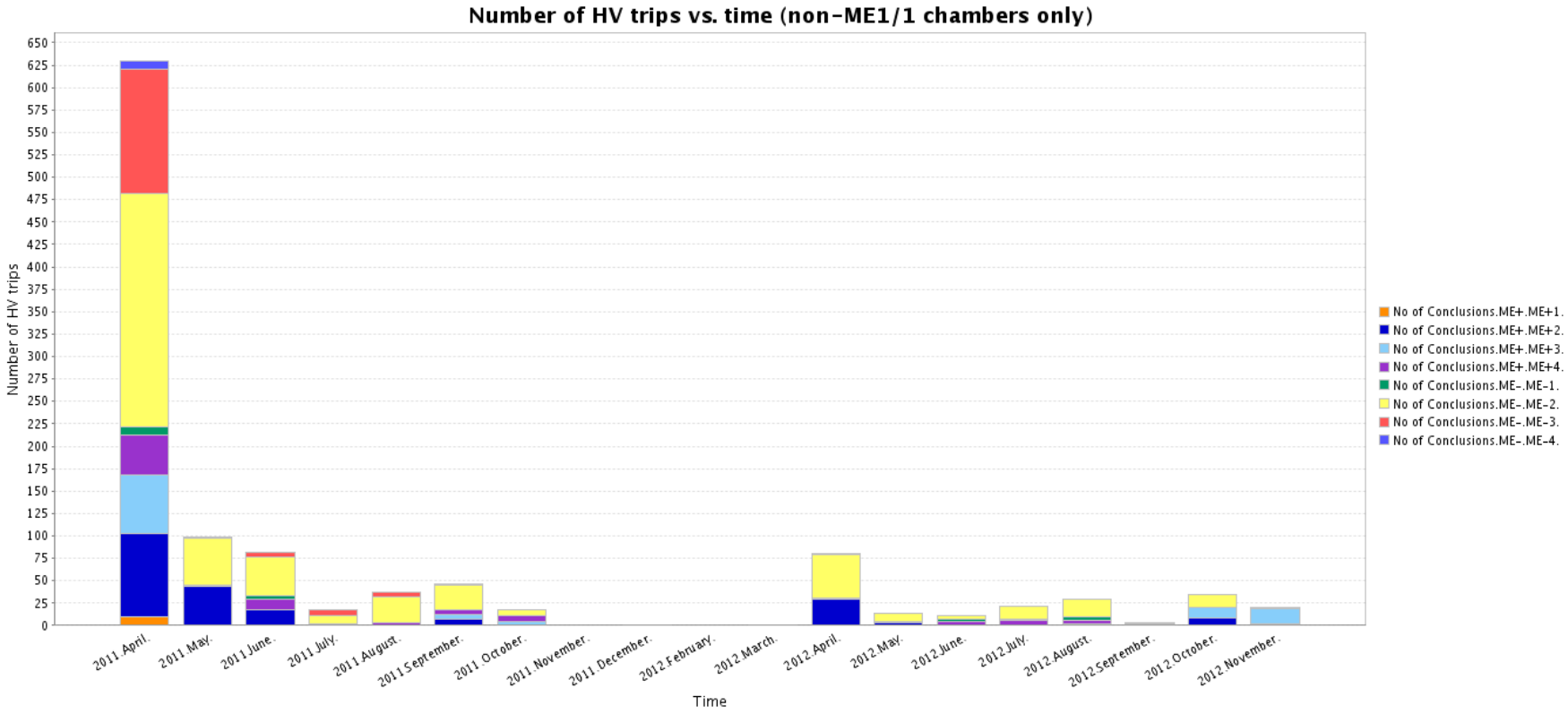
The number of channels at lower HV is 85 (out of 9400).



At L=3.5x10^33 cm-2s-1 the HV current of the CSCs in the inner rings is already higher than 2 uA.

At L=7x10^33 we have no choice and must raise the threshold of the HV current trip to 10 uA in the inner rings.
The CSC of the outer rings can stay with the current 5 uA threshold.

HV System. Number of HV trips



Посление 2 года без доступа к детектору удалось обеспечить стабильную работу CSC в условиях повышенной светимости LHC

Shifts in 2012

General Requirement for 2011: 6 points per Author

- PNPI participates in Trigger and DCS Central shifts --- 177.5/106.8 (shift-points).
- CSC DQM shifts --- 42 shifts (6 weeks)

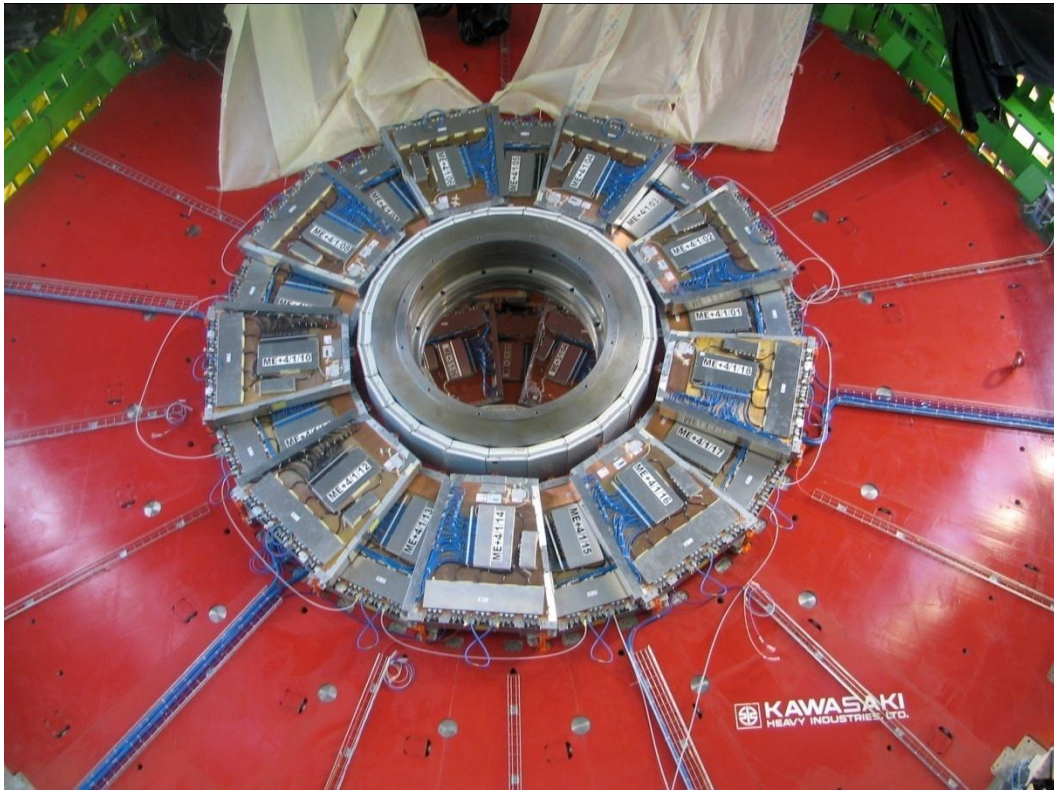
- Run Coordinator: CMS need in Central shifts during LS1 2013
- **Proposed: each institute needs to contribute with**
- **2.4 credits per M&O author in 2013**

CSC Upgrade I

- Original design unfinished – ME4/2 not built
- 72 ME4/2 chambers to complete system
  - Identical to chambers already built and working well
  - Increase redundancy of system
  - Efficient triggering at high luminosities

ME4/2 Upgrade

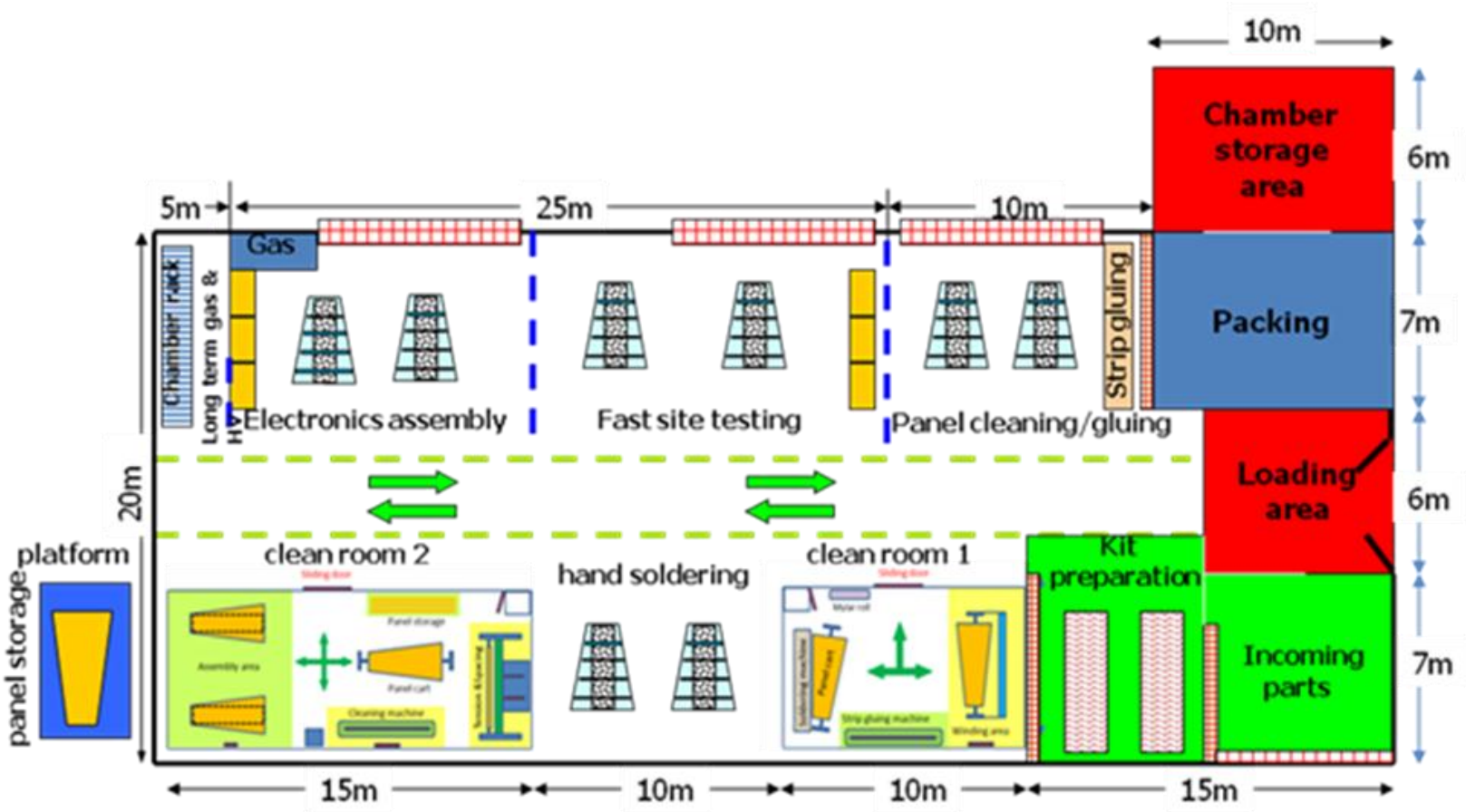
R&D
Production of 31 CSC



CSC Production Plans

- Assembly in B904 factory at CERN
  - Currently being renovated – occupancy end of 2010
  - ~1000 m^2 space with good services
  - CERN will provide two clean rooms for CSC
- Shipped tooling and parts from Fermilab
  - Parts for approximately 3 prototypes + spares
  - Shipment has arrived in B904
- Plans for 2011
  - Plan to set up machines in January – February 2011
  - Then produce 2-3 prototypes as part of a learning curve (debug systems and train personnel)

ME4/2 Upgrade



ME4/2 Upgrade

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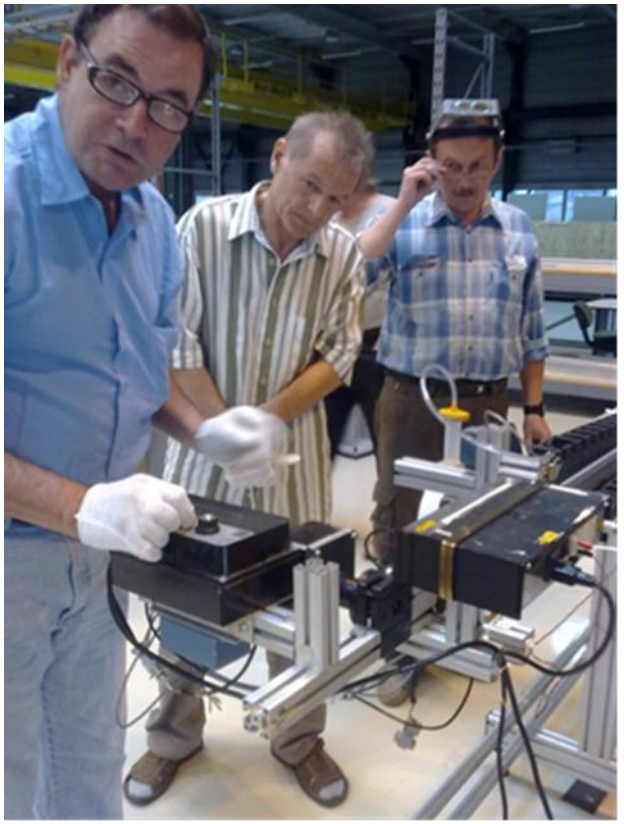

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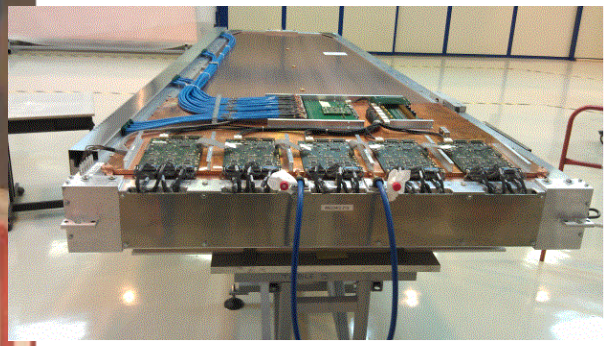

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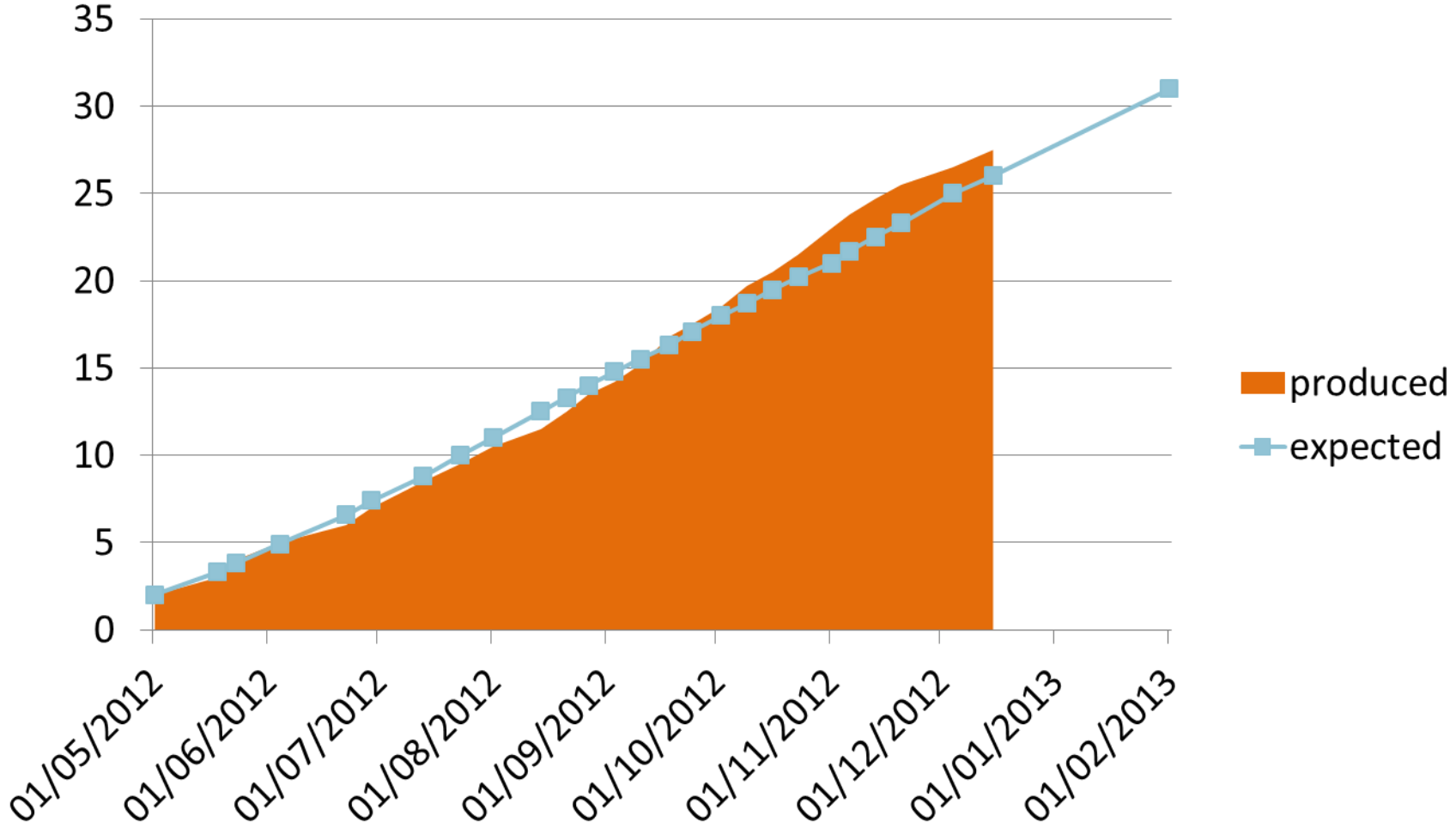

ME4/2 Upgrade