



## **Progress Report**

# *Activities*

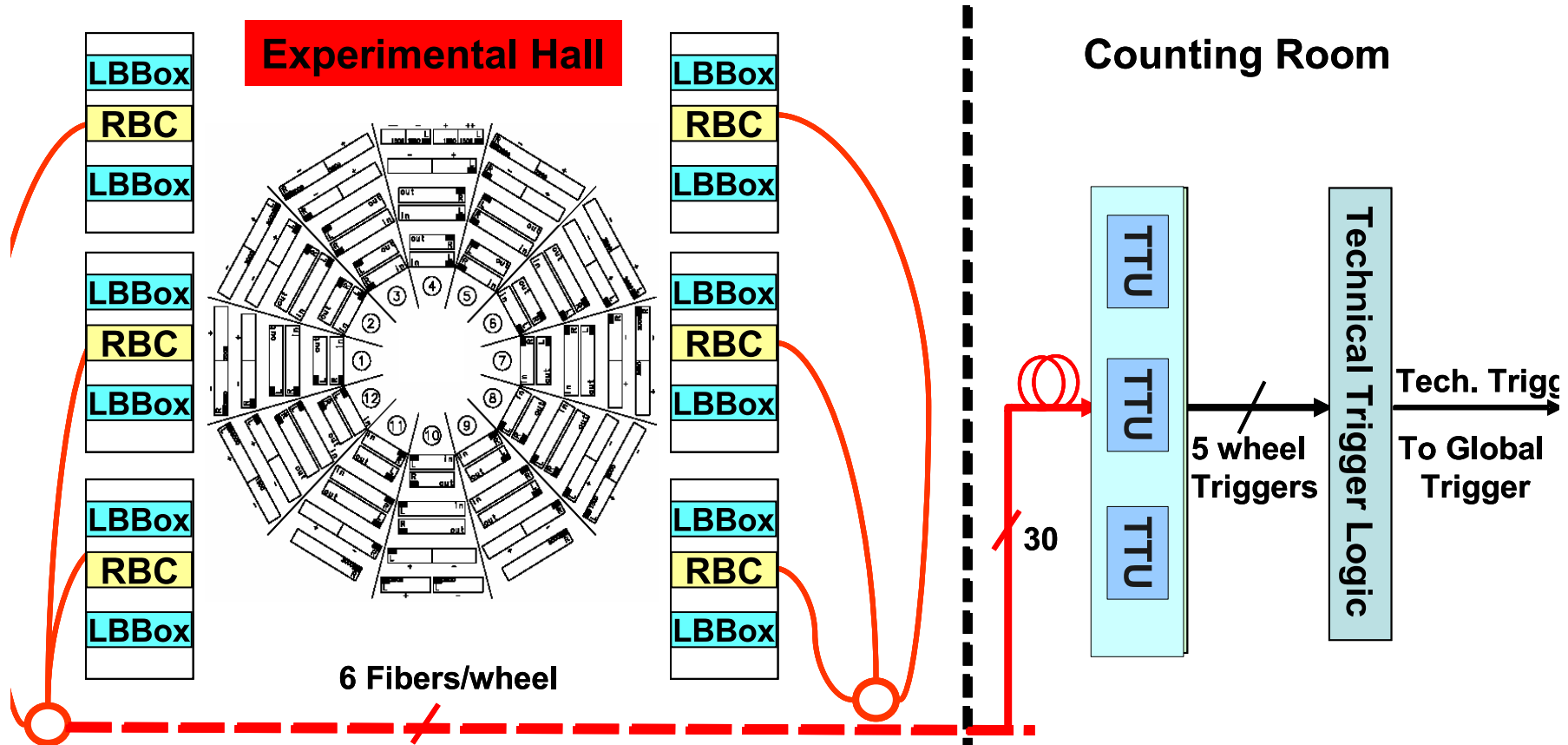
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# TTU Emulator

# Reminder - Context



From F. Loddo (Ref [2])

Main software development aspects are completed:

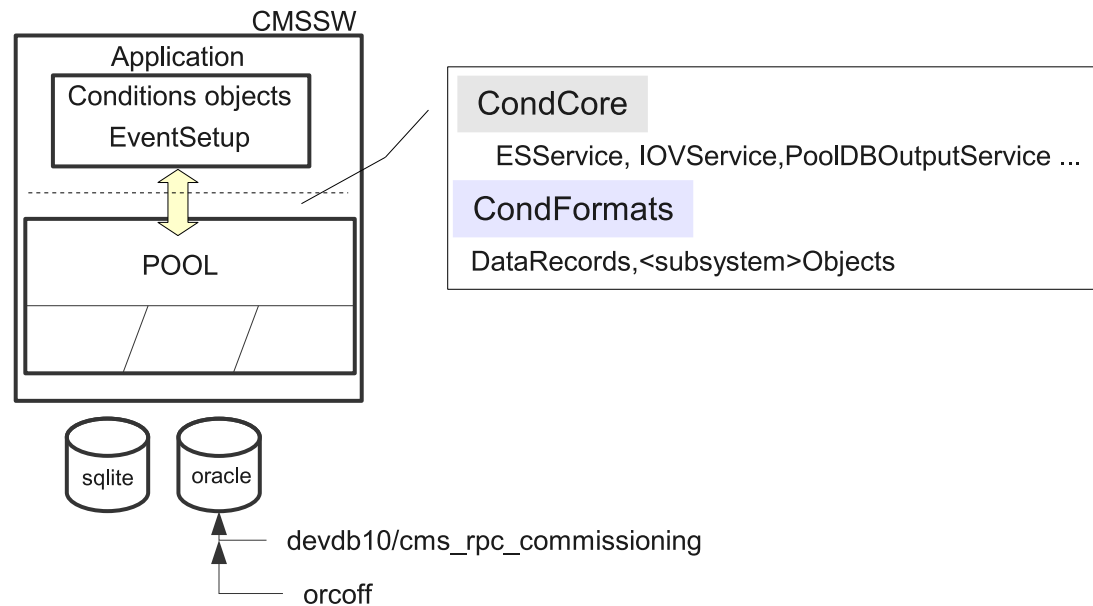
- Integration with CMSSW: done
- Condition objects (hardware configuration) are accessible to the application through the `CMSSW :: EventSetup`
- The conditions exist in the form of C++ objects associated to tables in a database
- The database backend has been tested in sqlite and oracle
- The oracle test is closer to reality: orcoff (the main offline repository for conditions) lives in an Oracle database
- Other aspects: the application reads input from RECO files
- Running over fully simulated cosmic muons: I apply a Tracking Algorithm

# Conditions Objects implementation



All the steps involved in the implementation is described in our TWiki:

<https://twiki.cern.ch/twiki/bin/view/Main/CMSUniandesGroupCondDB>



All conditions are handled in two kinds of objects: **RBCBoardSpecs** (RBCBoardConfig) and **TTUBoardSpecs** (TTUBoardConfig).

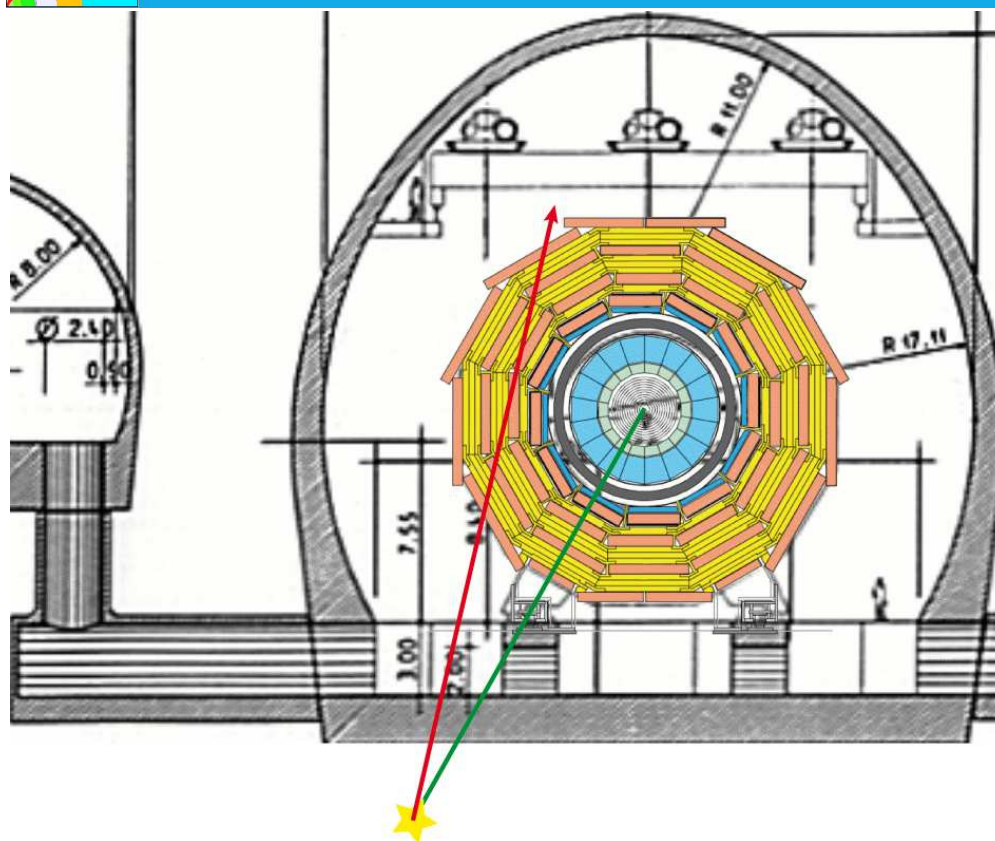
- The main objective of the TTU emulator is the validation and debug of the RPC technical trigger
- The next step for the code is to become officially part of CMSSW
- Further work and validation should come from the RPC top management
- From last CMS Week: a possible application would be BooMerang! (Piotr Zalewski presentation)

<http://indico.cern.ch/conferenceDisplay.py?confId=44277>





## BooMerang idea



To measure **stau** lifetime greater than microseconds and smaller than thousand of seconds one needs special trigger.

Majority of **staus** will stop in the rocks surrounding CMS cavern.

Almost 1/5 of them will have **muon** in decay products.

About 1/40 of these **muons** will point back to the CMS.

In 1% of SUSY events **muon** from **stau** decay **should go backward through the CMS.**





# Backup Slides

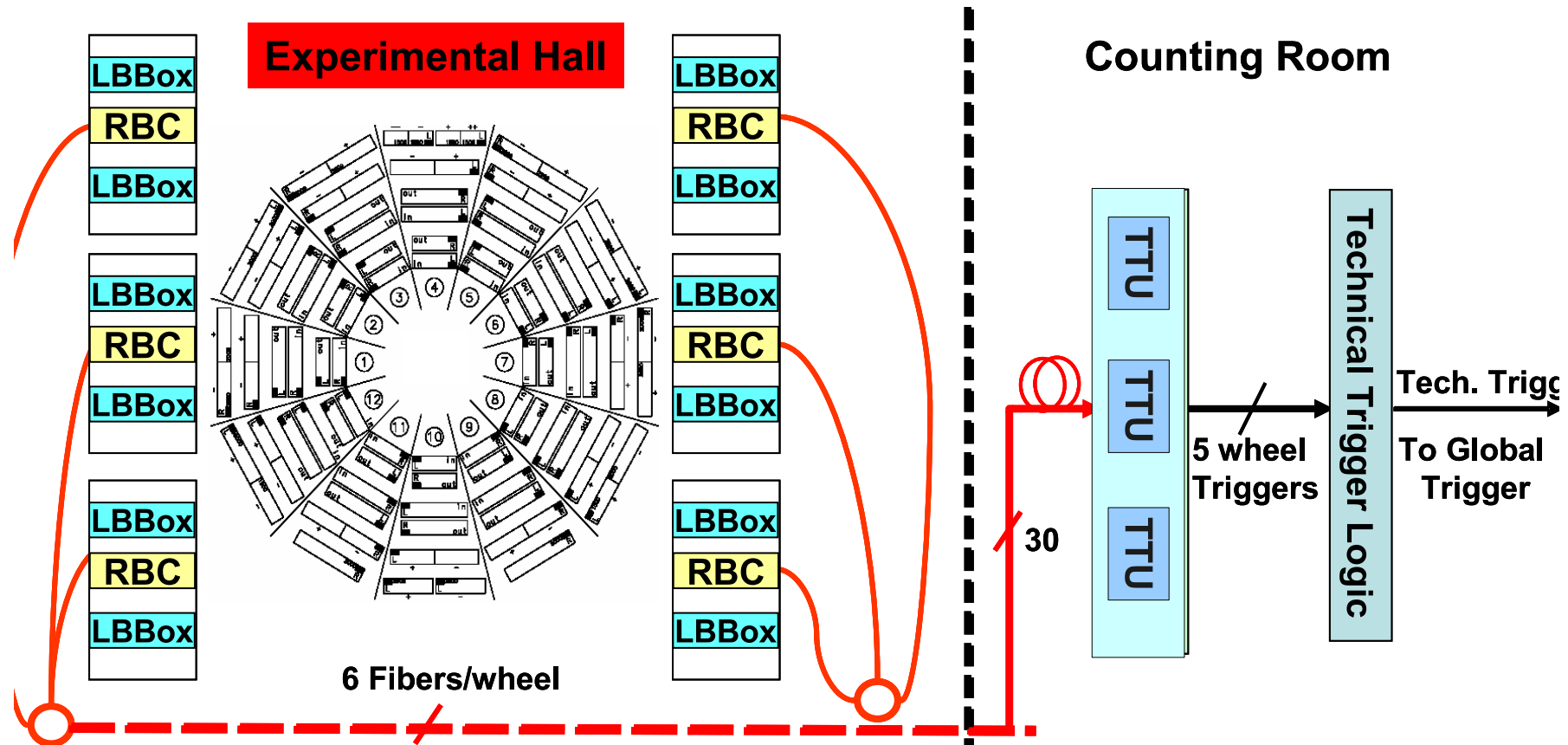
Sub-detectors at CMS have the ability to send special trigger signals known as **Technical Triggers**. These signals are used for test and calibration.

- The Resistive Plate Chambers or RPC are part of the Muon Trigger system.
- The RPC have implemented a Technical Trigger: the **RPC Balcony Collector (RBC) Technical Trigger**

In particular, the RBC-TT was designed to trigger on **cosmic muons**.

# RBC Technical Trigger

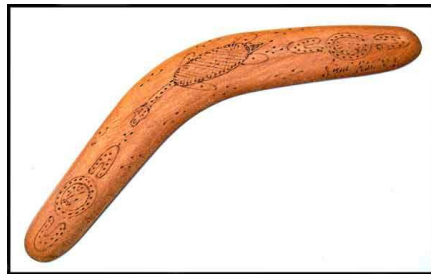
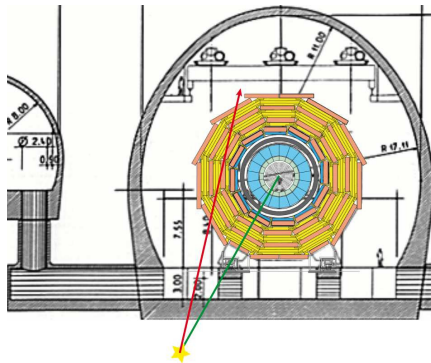
New boards were implemented:



From F. Loddo (Ref [2])



## BooMerang: the road map



- Stopping stau distribution simulation
- Adaptation of cosmic muon simulation
- BooMerang L1 patterns
- BooMerang RPC firmwares
- BooMerang HLT algorithm (crucial point)
- BooMerang implementation (even more crucial)
- HSCP discovery at 10/fb?  
(SUSY x-sec not less than 10fb)
- First BooMerang lifetime measurement at 100/fb?

We are looking for collaborators!

## References

- [1] Loddo F. *A configurable Tracking Algorithm to detect cosmic muon tracks for the CMS-RPC based Technical Trigger.* xxxxx, Mumbai, 2007.
- [2] Loddo F. *An RBC based Technical Trigger for the CMS Experiment.* xxxxx, Valencia, 2007.