

# FTK IAPP Workshop and Training report

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## 1 Introduction

From 10 to 13 March 2015 a series of correlated events were organized at LPNHE in relation to FTK IAPP activities:

- Workshop on Track Trigger at Phase-II in ATLAS and CMS (10 March 2015)
- FTK IAPP General Assembly and Executive Board (11 March 2015)
- FTK Training on Silicon Detectors & Associative Memories (12-13 March 2015, mornings)
- FTK Collaboration Workshop (12-13 March 2015, afternoons)

## 2 Workshop on Track Trigger at Phase-II in ATLAS and CMS

The workshop agenda is available here <https://indico.in2p3.fr/event/11355>

The event saw the physical participation of 10 people from both ATLAS (and FTK IAPP) and CMS collaborations plus some connected via Vidyo link.

The focus of the workshop has been on the current and foreseen tracking trigger projects for Phase-2 in both experiments and the common R&D that is possible. Both collaborations strongly push for operate in synergy at R&D level in order to mitigate the overall cost and optimize the technology quality.

It has been a very useful 1-day workshop where it was possible to confront ideas and strategies, define specifications for common R&D (in particular the AMchip developements) and strengthen the collaboration.

In particular the presentation of Christos Gentsos about FTK IAPP SLP1, originally foreseen for the FTK IAPP Executive Board, has been moved to this session because it was of special interest for the Phase-2 projects

### **3 FTK IAPP General Assembly and Executive Board**

The agenda of the General Assembly (GA) and Executive Board (EB) is available here <https://agenda.infn.it/conferenceDisplay.py?confId=9246>

All GA and EB were present either physically or via video connection.

In the morning the status of the FTK IAPP project was discussed, with a particular attention to GANTT chart for secondments and the status of deliverables and milestones. We reviewed also the strategy for outreach, we planned future events and reviewed the risk assessment for our project.

### **4 FTK Training on Silicon Detectors & Associative Memories**

The agenda is available inside the FTK Workshop agenda here <https://indico.cern.ch/event/373187/>

This training was split in two mornings and saw the participation of all the FTK IAPP members that participated the GA and EB the day before, plus some of the participants of the FTK Workshop.

The first morning was dedicated to Silicon Detectors. A main activity of the ATLAS group at the LPNHE laboratory, other than FTK, is the development of silicon detectors and front end electronics. Marco Bomben (MdC at University of Paris 7, researcher at LPNHE) gave an introductory lecture about state of the art silicon detector technology and also about microchannel cooling, an advanced silicon cooling technology that might be of interest also for Associative Memory electronics. Roberto Beccherle (FTK IAPP researcher seconded from INFN Pisa to LPNHE) gave a lecture about front-end electronics for silicon detectors with a particular focus on the current FE-I4 chip and the future RD53 chip under development.

The second morning was dedicated to Associative Memory. Saverio Citraro gave a presentation about the actual usage of Associative Memory chips in the FTK hardware on the Associative Memory Board. Francesco Crescioli gave two presentation about how to emulate an Associative Memory chip in software with practical python example code and a second presentation about how to use Associative Memory to do computation, a thought provoking approach about how to do sums with memory-only devices..

### **5 FTK Workshop**

The agenda is available here <https://indico.cern.ch/event/373187/>

The event saw the physical participation of about 30 people from the whole FTK collaboration and the ATLAS TDAQ management. The event was scheduled in the afternoons in order to allow maximum participation via video link of the FTK collaborators from their time-zone.

The current status of the FTK project was discussed and the strategy for the

next steps was outlined. It has been a very important moment for the FTK collaboration to be all present at the same time along with the ATLAS TDAQ management.

A social dinner has been organized the 12th evening.

## **6 Final remarks**

It has been a very intense 4-days of workshops, meetings and training. The intensity of the events has been compensated by the fruitful discussion. It has been a good idea to group together many events with slightly different public, but with a strong overlap with the FTK IAPP project, in order to enable new connections and new exchange of ideas.

Special thanks to the LPNHE administration for providing support and rooms.