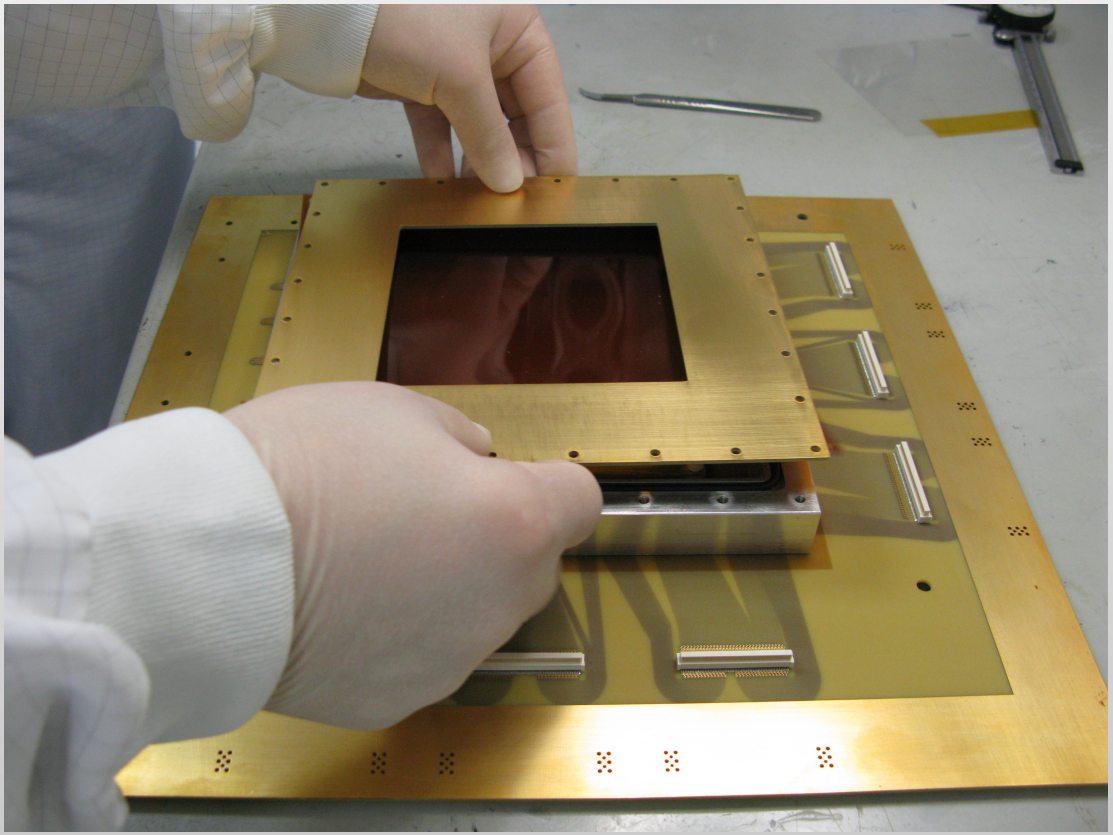
# PRESENTATION OF INFN ROMATRE GROUP

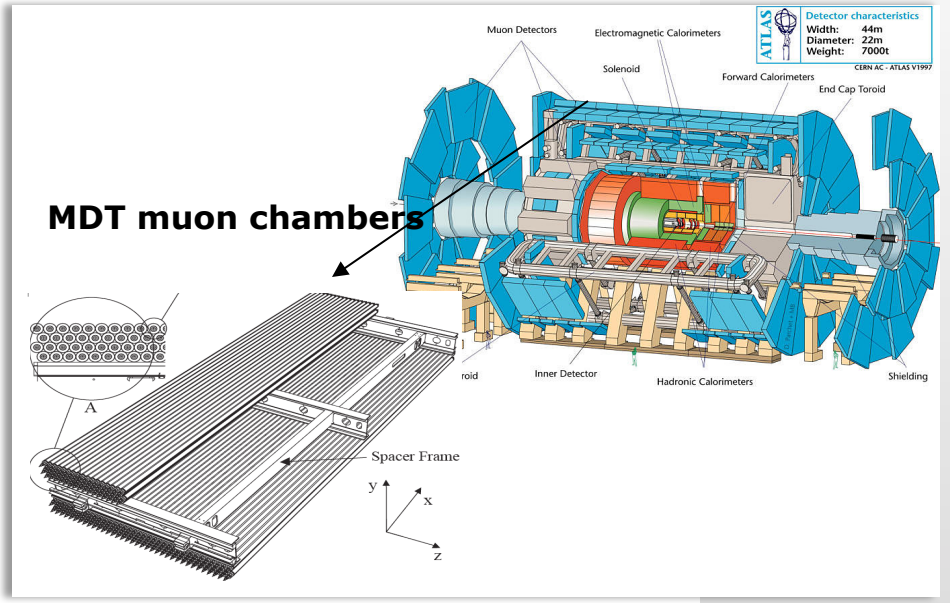
RD51 Collaboration Board, February 1st, 2013

*Mauro Iodice – INFN Roma Tre*



# THE GROUP – PEOPLE – PRESENT/PAST ACTIVITY

- The following 6 people from RomaTre express the interest to join the activities of RD51 Collaboration:
  - Toni Baroncelli
  - Michela Biglietti
  - Paolo Branchini
  - Mauro Iodice
  - Fabrizio Petrucci
  - Monica Trovatelli (PhD)

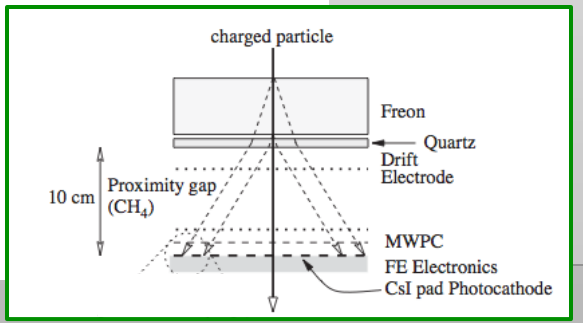



- Current main experiments:
  ATLAS and Kloe

- Main Detector Activity in the context of current experiments:
  - Construction/Equipment/Certification/Commissioning **of MDT Chambers for the ATLAS BARREL Muon Spectrometer**
  - Extensive activity of muon tracking detector performance studies
  - KLOE Trigger and DAQ including implementation for DAQ-GEM

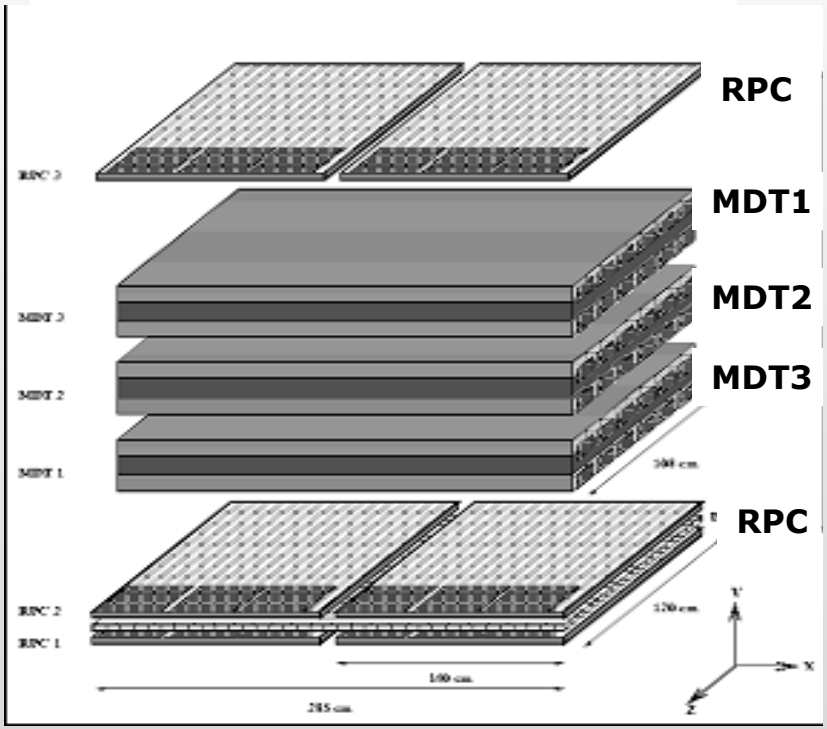
- Past experience with MPGD: proximity focusing

Freon CsI RICH Detector for Jlab (same as ALICE Rich)



# ROMA TRE LABORATORY (PAST AND PRESENT)

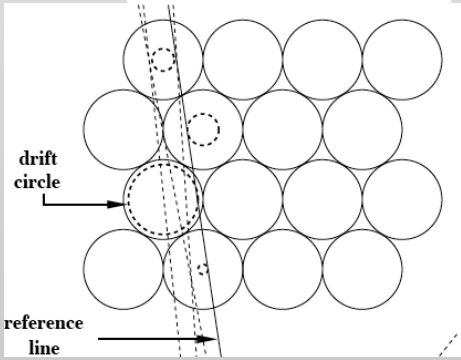
- **The RPC Cosmic Rays Hodoscope for MDT tests/certification (years 2002 – 2008)**



**MDT-Readout**

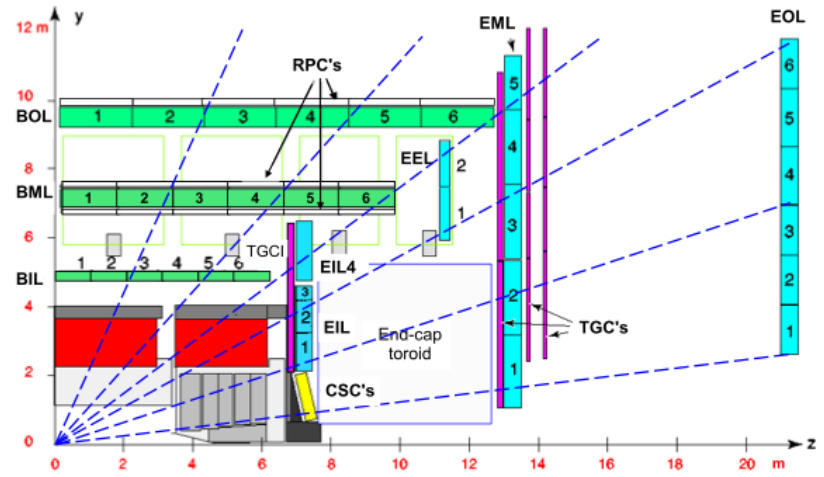
**MDT-Track reco**




- **The Cosmic Rays Hodoscope is now equipped with scintillators and in operation to test MICROMEGAS**

# PRESENT ACTIVITY IN THE CONTEXT OF MPGD

- For more than one year we are working for the **New Small Wheel** UPGRADE of ATLAS within the *Muon Atlas **MicroMegas** Activity (MAMMA Collaboration)*



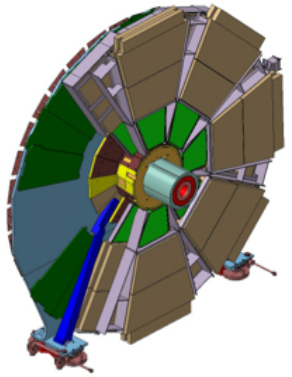



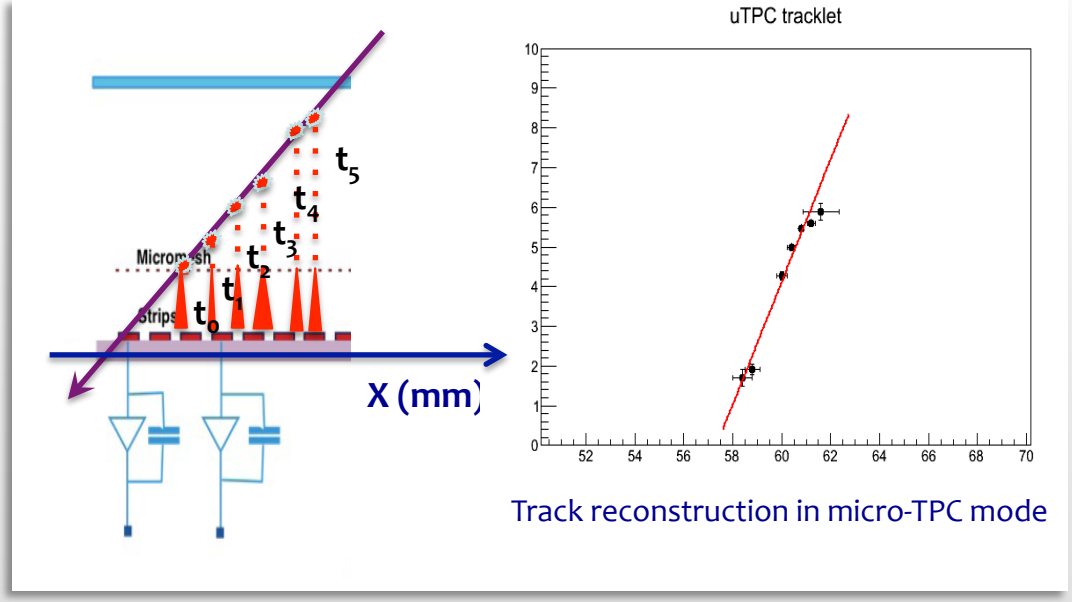
**Figure 2.1.** Left: A z-y view of 1/4 of the ATLAS detector. The blue boxes indicate the end-cap MDT chambers and the yellow box CSC. Right: A view of a small wheel mounted on the JD disk shielding.

The MicroMegas is one of the NSW chosen technology aiming at precision tracking (~100μm per plane) and L1 Trigger capability

- The Roma Tre group has been actively involved in 2012 campaign of test beams and performance studies on small area MM and first tests and analysis of Large area MM

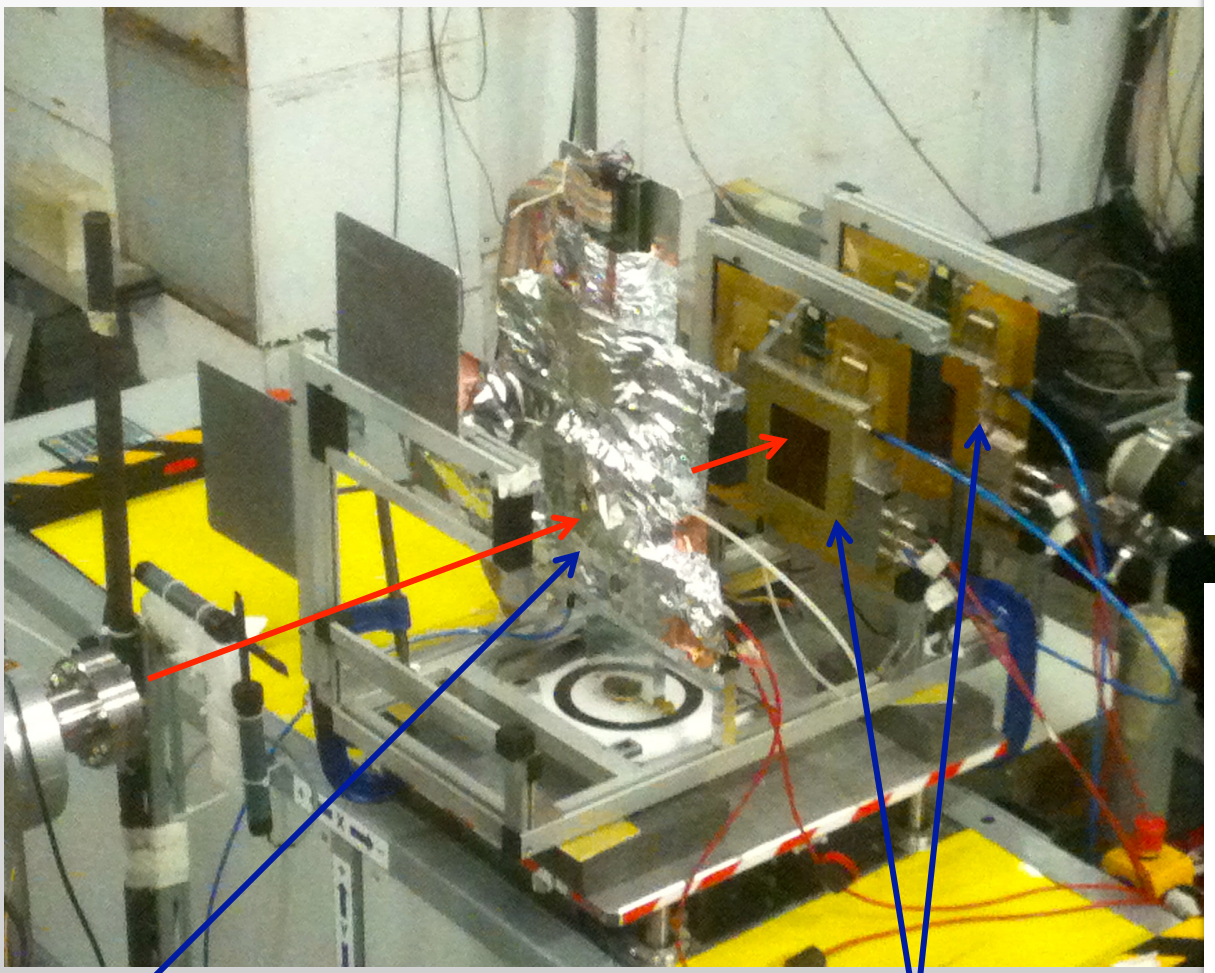
# PRESENT ACTIVITY IN THE CONTEXT OF MPGD

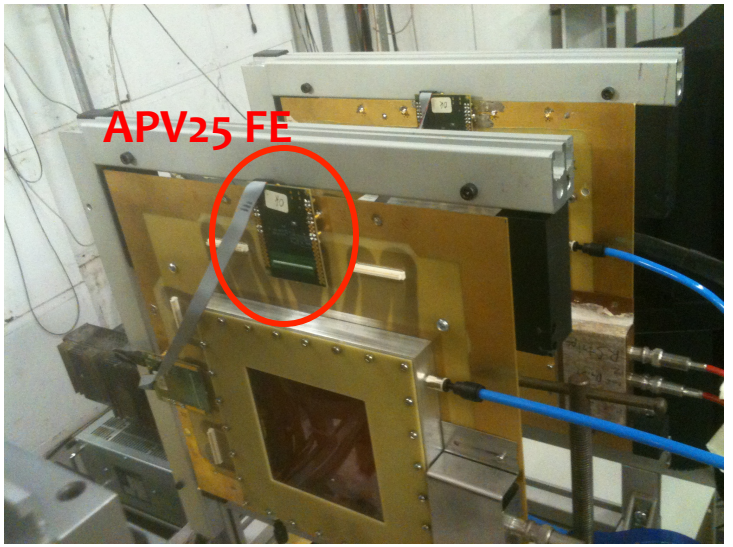
- Main activity is currently focused on MicroMegas studies:
  - continue with cern Test-Beam performance studies of MM with inclined tracks and B-field effect (see yesterday's talk by K. Ntekas)
  - Comparison of performance with different FE electronics (APV, VMM1, trans-impedance FE)
  - Cosmic rays and TestBeams in Frascati (see next slide)
  - Characterization and performance of Large area MicroMegas
  - First studies on mechanical construction of large area MicroMegas
    - ➥ Collaboration within Italian Institution for the MM Construction Center in LNF

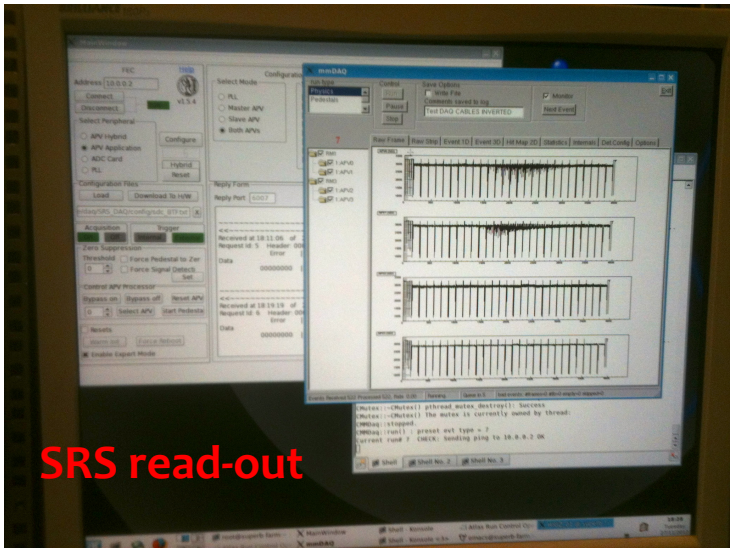


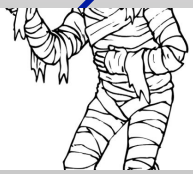

Track reconstruction in micro-TPC mode

# TEST-BEAM AT THE BEAMTESTFACILITY @ LNF END OF NOV.2012





LNF MM with trans-impedance FE

RM1 and RM3 MM with APV25 FE

# FUTURE PLANS

- Large area MicroMegas performance studies (inclined tracks, B-field)
- Test under high occupancy with irradiation sources
- Performance studies with high resolution time measurement electronics
- Timing properties for trigger capabilities
- Performance studies of 2D track reconstruction with different orientation of read-out strips (simulation with x-y, stereo, etc...)
- Definition of the layout and construction of prototypes of a MM sector
- Definition of Quality Control Procedures and set-up of tooling for production certification and detector commissioning
- Construction of the NSW MicroMegas Module-0 (by 2014)

MOREOVER

-- we are also interested to extend our expertise for applications other than high energy physics experiment (e.g. Large area muon tomography, … )