KL & Downstream PID Trolley

MICE Collaboration

MICE-NOTE-DET 337

15 February 2011

Analysis of PID detectors (TOF and KL) performances in the MICE 2010 run

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The performances in the 2010 run of the main installed PID detectors of MICE: the time-of-flight system and the KL downstream calorimeter are reported in this paper. All detectors have shown a stable behaviour during all the run, with minor hardware problems, and performances compatible with the expectations.

[1] Now at Sofia University St. Kliment Ohridski

[2] Partially supported by INFN, sezione Milano Bicocca

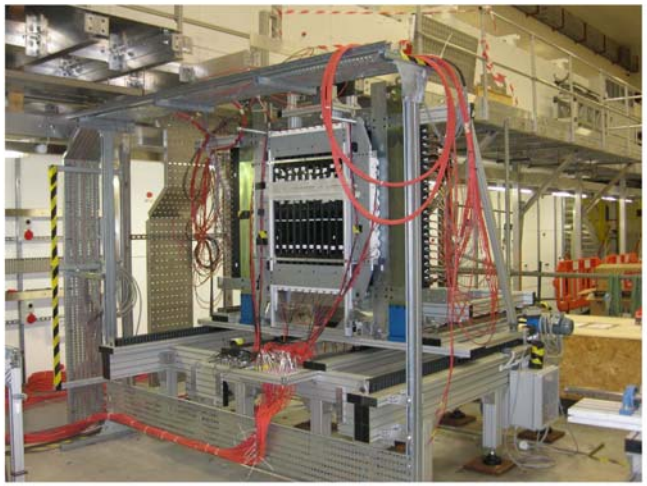
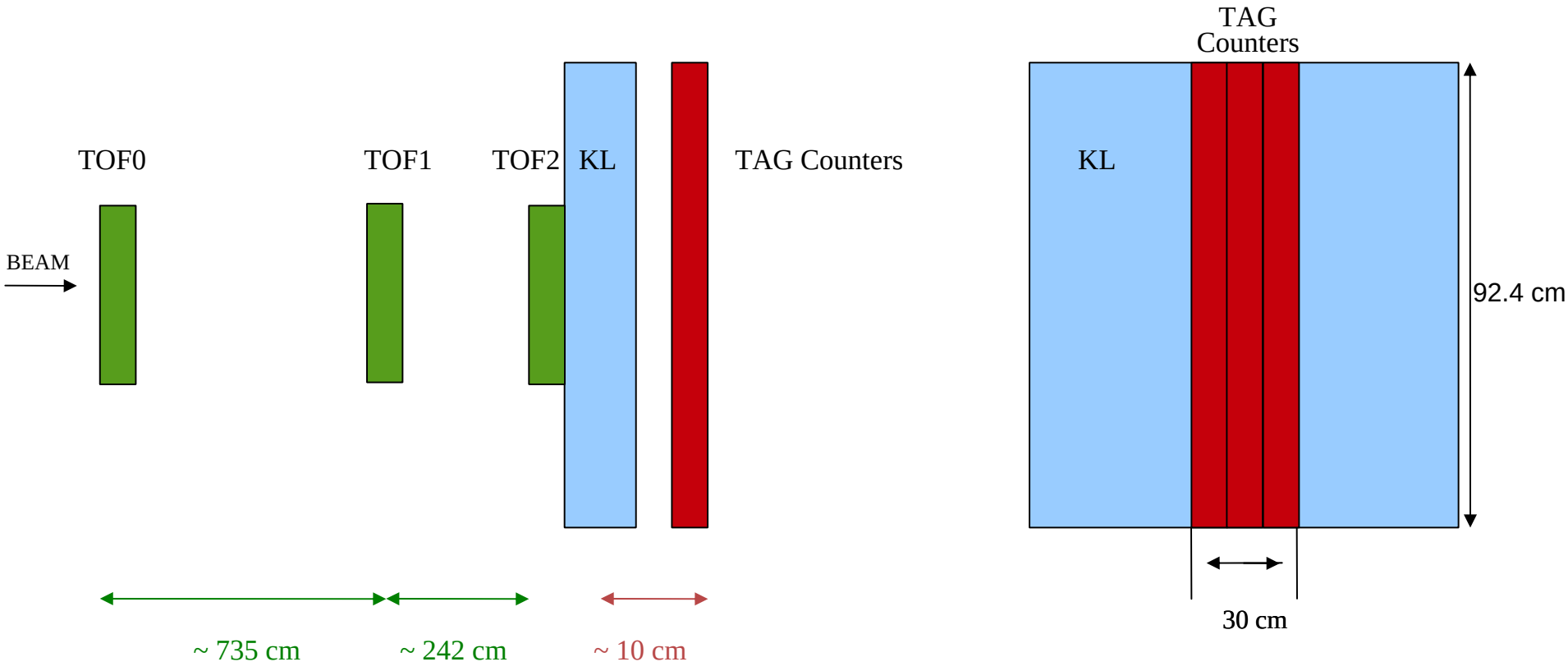


Fig. 2. TOF2 in front of KL on their final downstream platform.

Since February 2010 combined TOF-KL-TAG data analysis has started to study the KL response to electrons, muons and pions at different energies

Sketch of current setup

Mariyan Bogomilov MICE CM27, July 2010



TAG Counters – 3 scintillator slabs, 10 cm wide each, 2.5 cm thick

KL response to μ - π - e

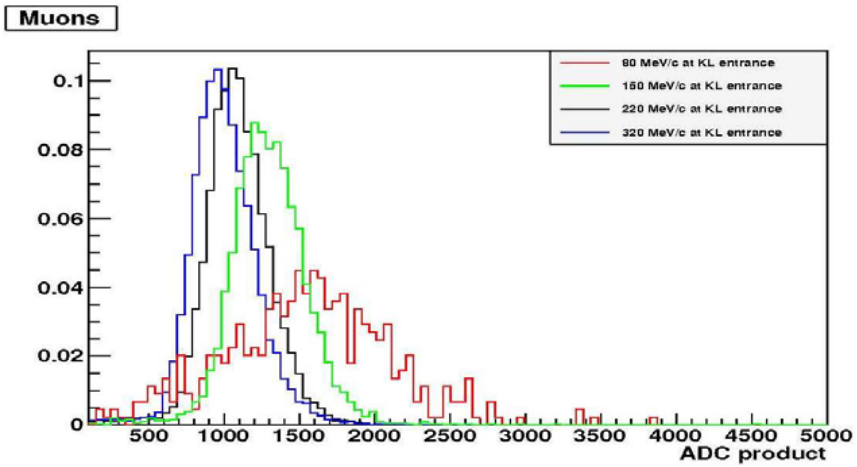


Fig. 23. KL response (normalized) to muons with different momenta.

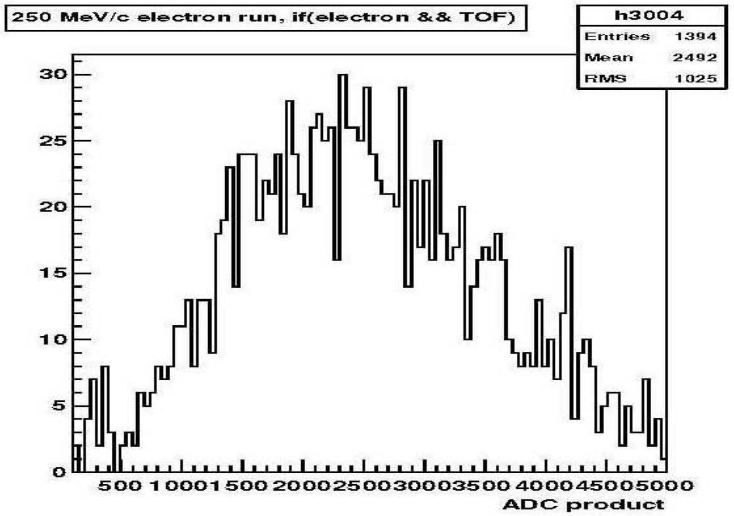


Fig. 24. KL response to 80 MeV/c electrons.

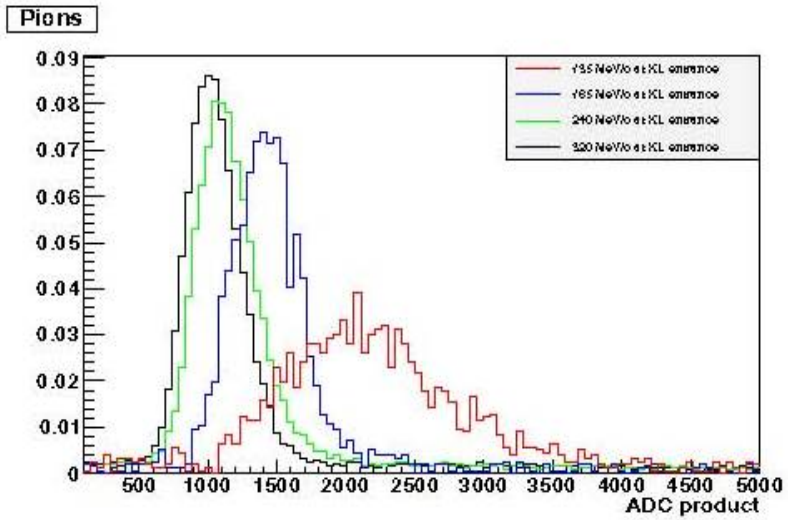


Fig. 26. KL response (normalized) to pions for different incident momenta.

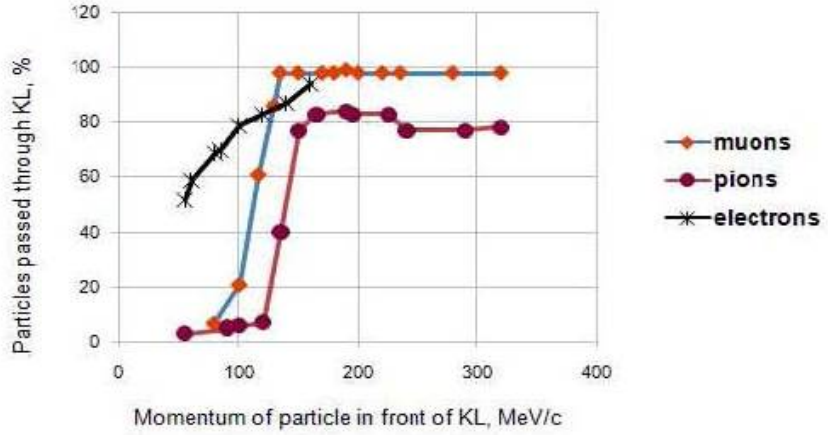


Fig. 27. The fraction of electrons, muons and pions passing through KL and reaching the TAG counters.

KL stability

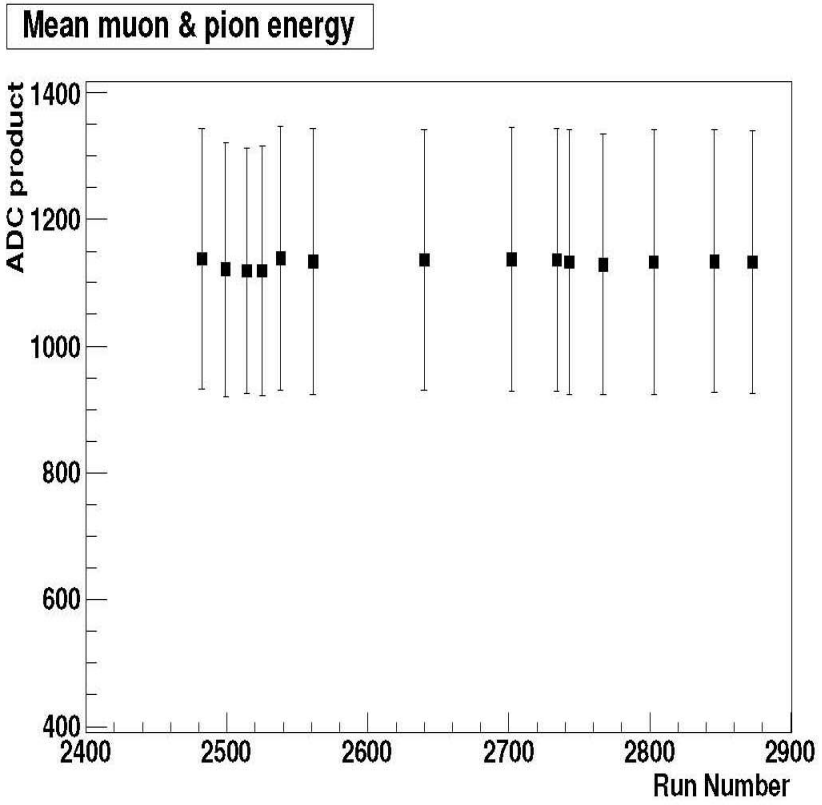


Fig. 21. Stability of KL response to muons and pions for nominal muon beam runs. The run number is on the abscissa, while on the Y-axis there is the ADC product. The error bars are the σ's of the Gaussian fit.

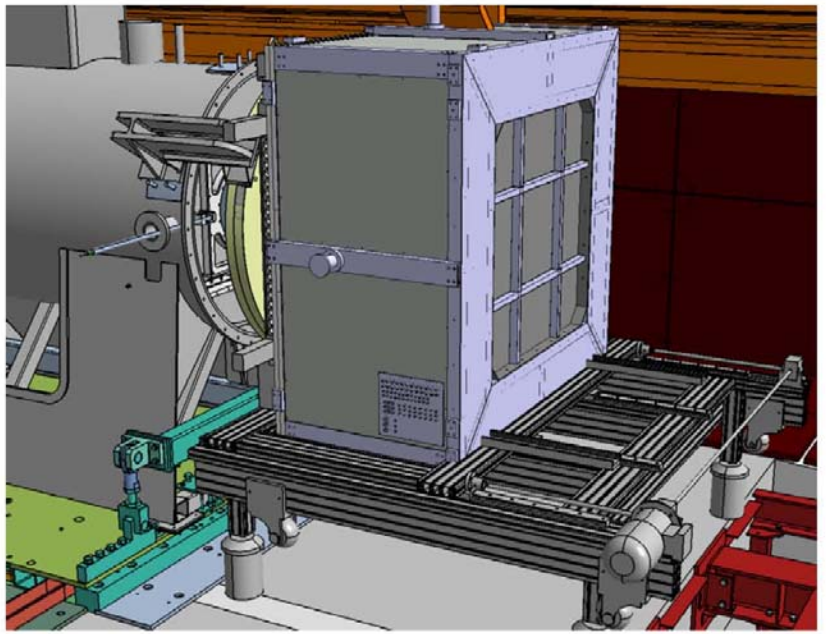
The study of KL stability during 2010 data taking has shown:

- No dead or noisy channels
- Pedestal stable with rms ~ 2.5 ADC counts
- Response to "MIP" (μ & π) stable in time

EMR Integration

- *It's now big and heavy….*
- *2.5 tonnes*
- *Will have to adapt KL trolley for clearance*
- *And make new independent frame for EMR, mounted to floor, with adjustments in X&Y*
- *But there's a solution*
- *Useful discussions this week*
- *INFN staff will also visit Uni Geneva*
- *This is one ingredient in re-defining the 2011-2012 plan*

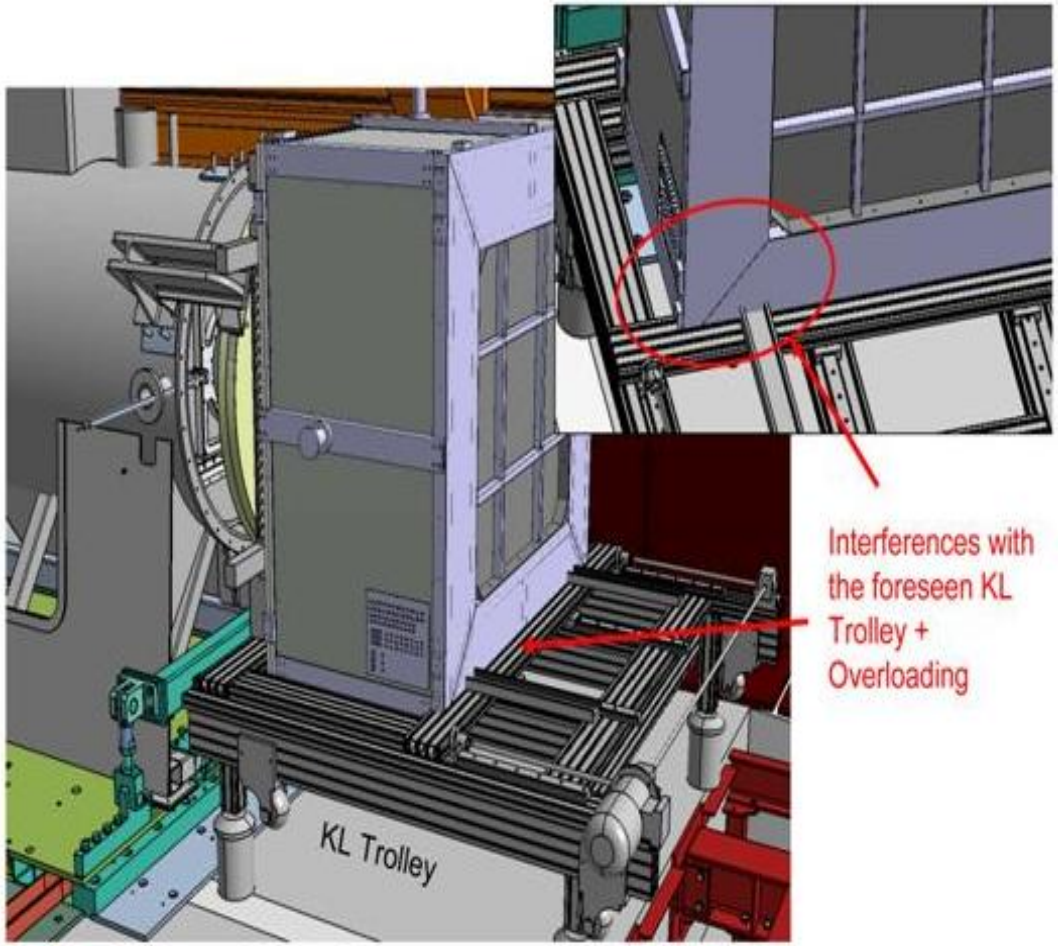
Andy Nichols – Sofia MICE CM28)

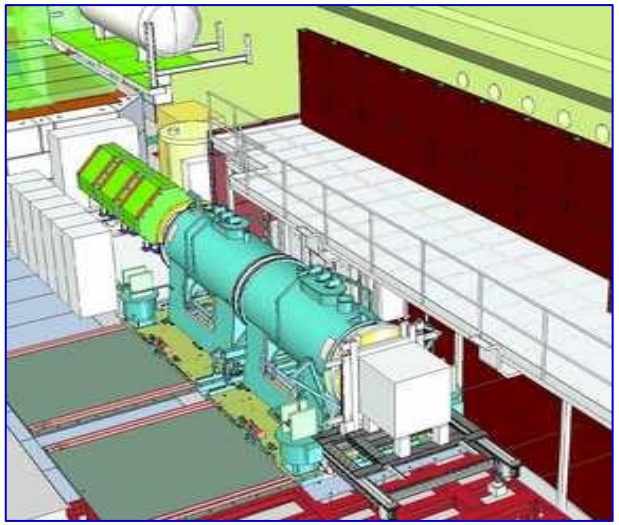


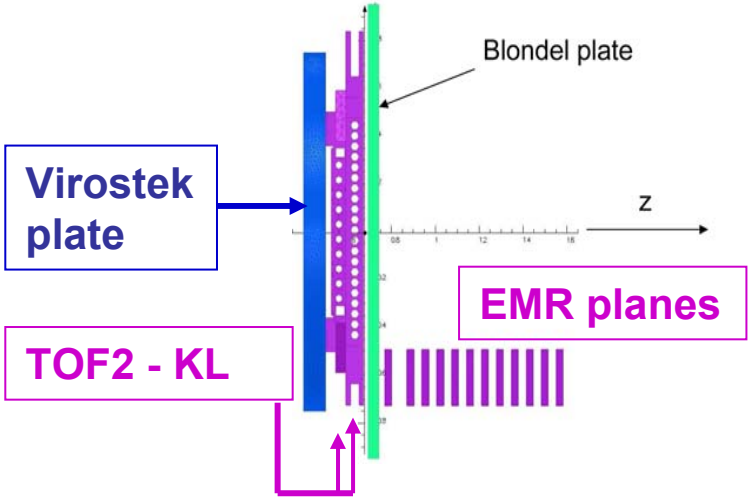
Meeting MiB, Rm3, UniGe in November 2010

Science & Technology Facilities Council

EMR Integration / Interference

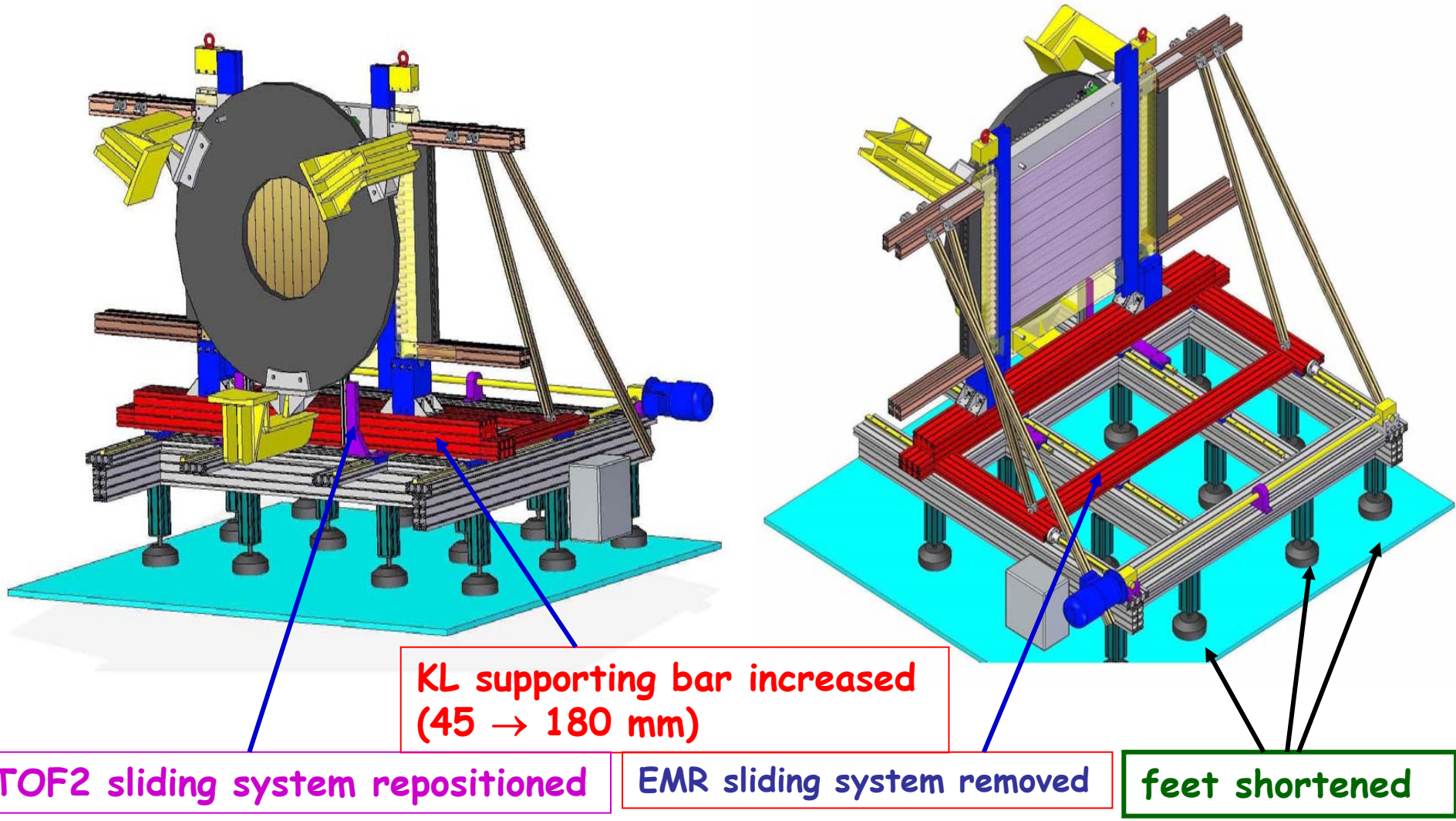






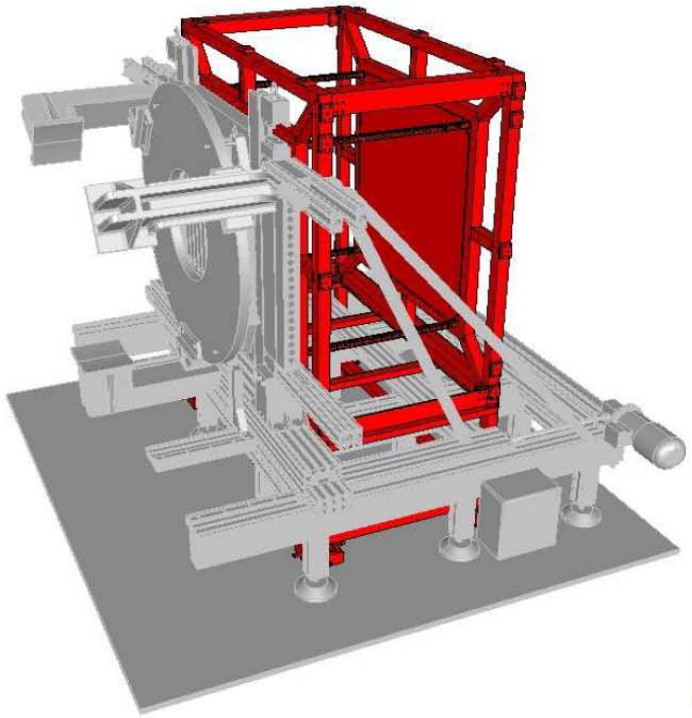
Downstream PID trolley - Update

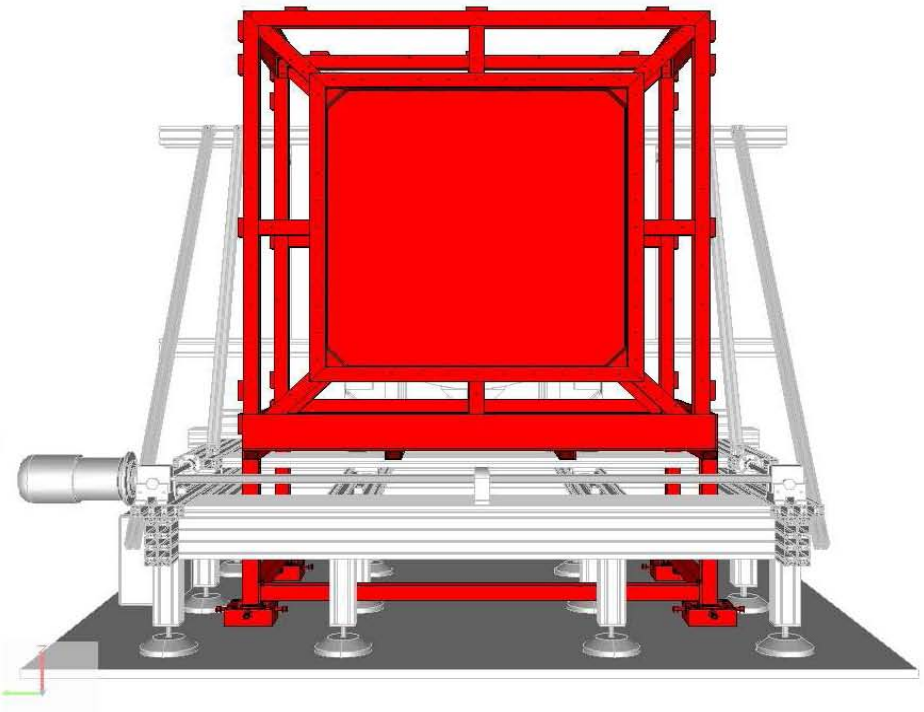
(partially done in november 2010)



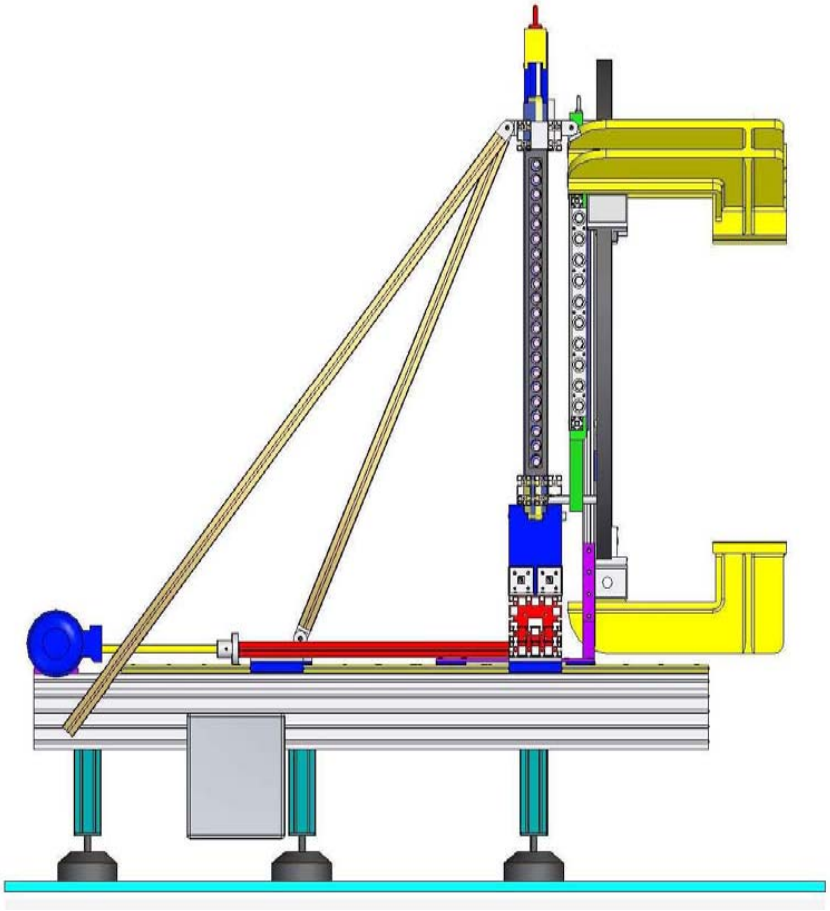
EMR at RAL

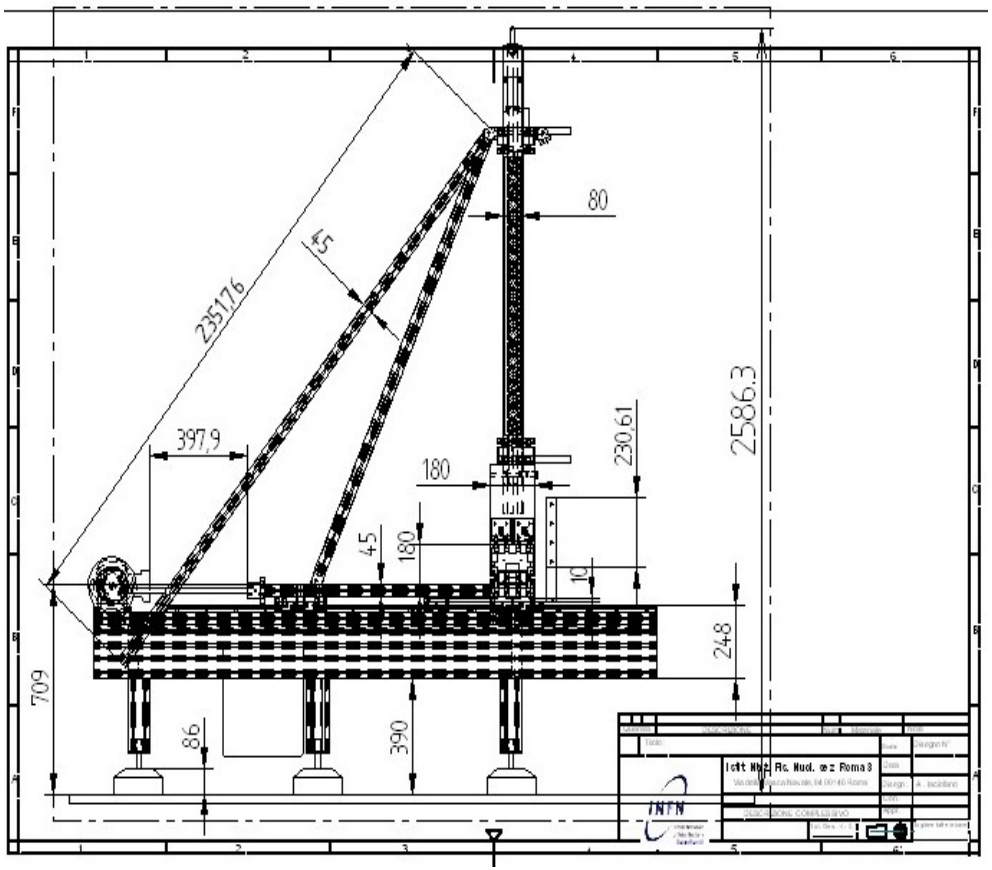
Integration with KL and Supporting Frame





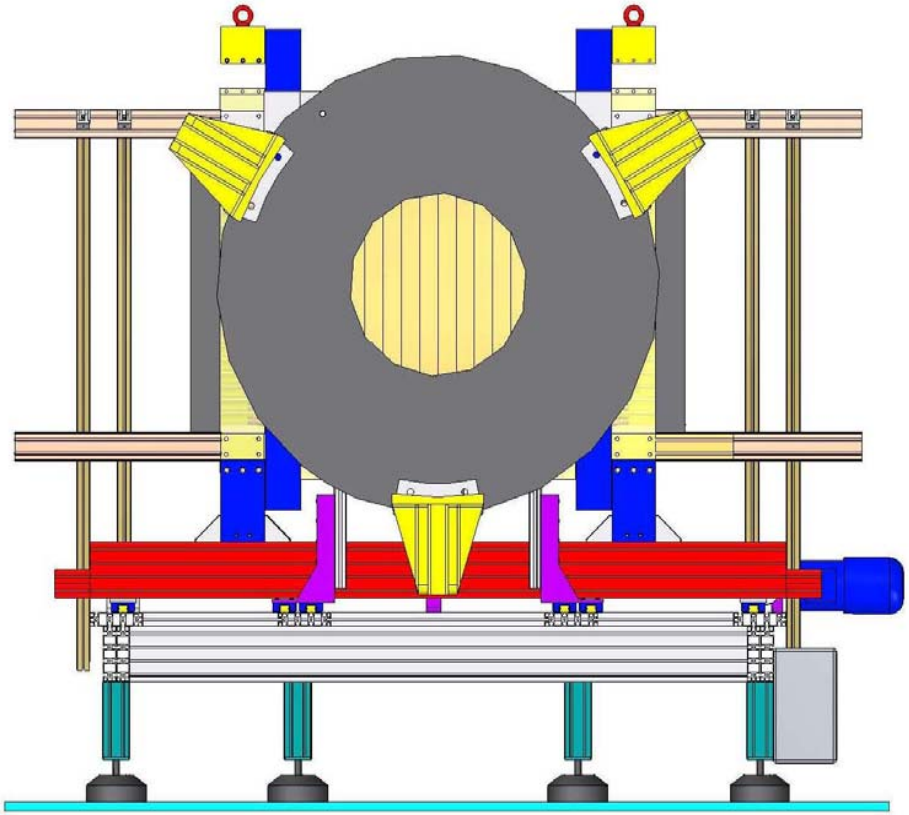
Trolley – side view

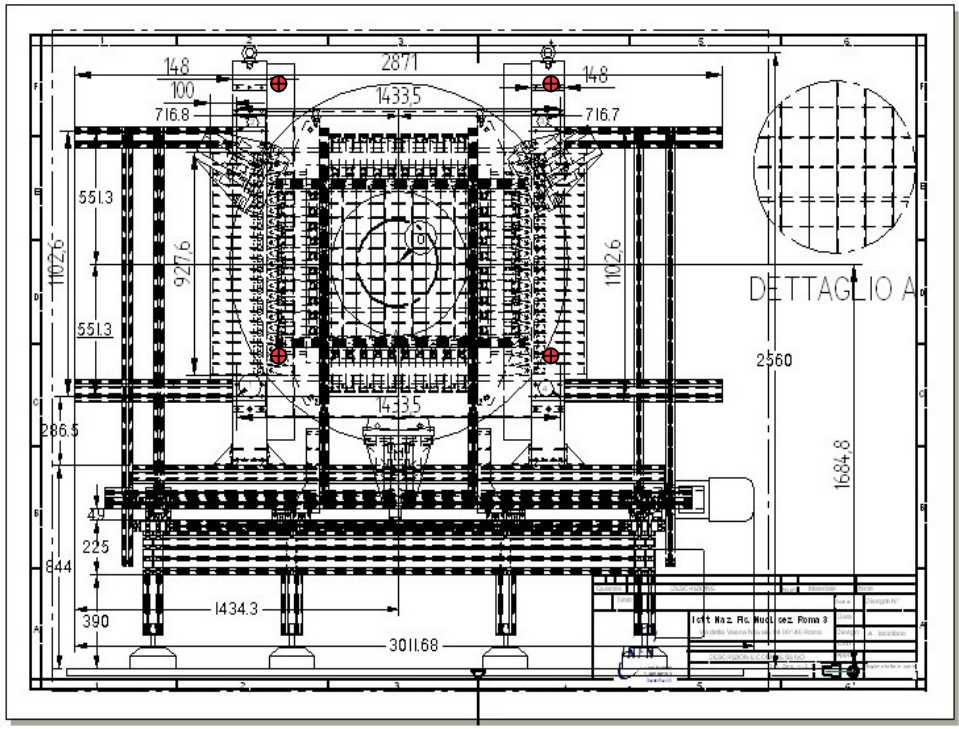




Part of materials needed for the upgrade already delivered to RAL and collected by Willie Spensly

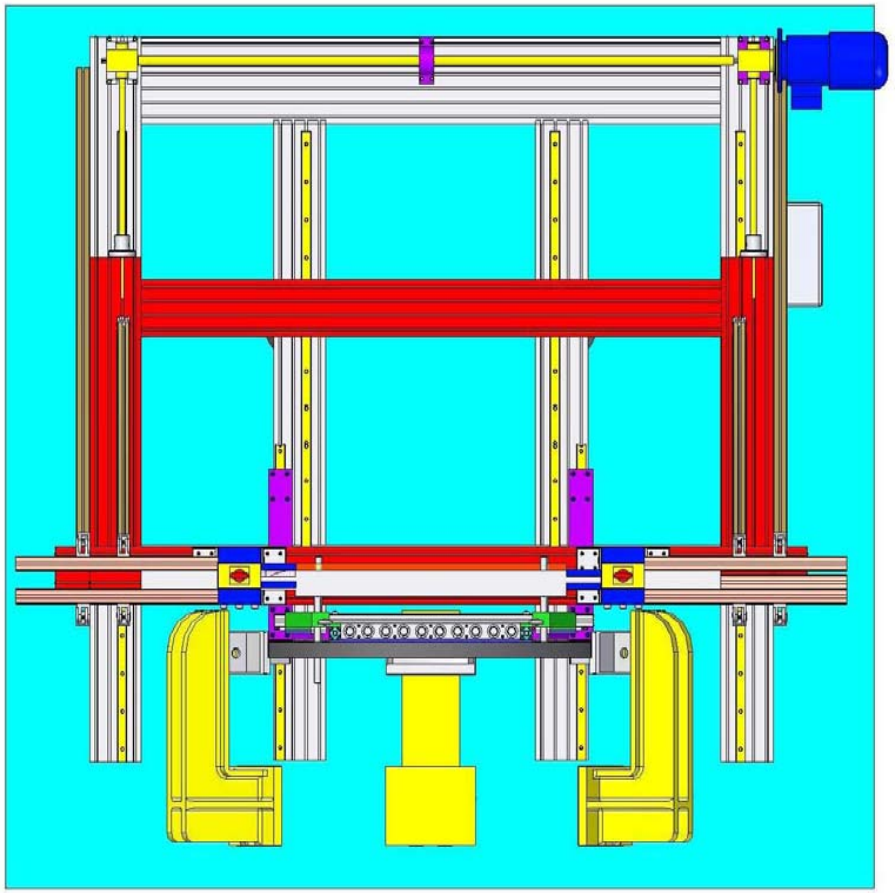
Trolley – front view for detector survey

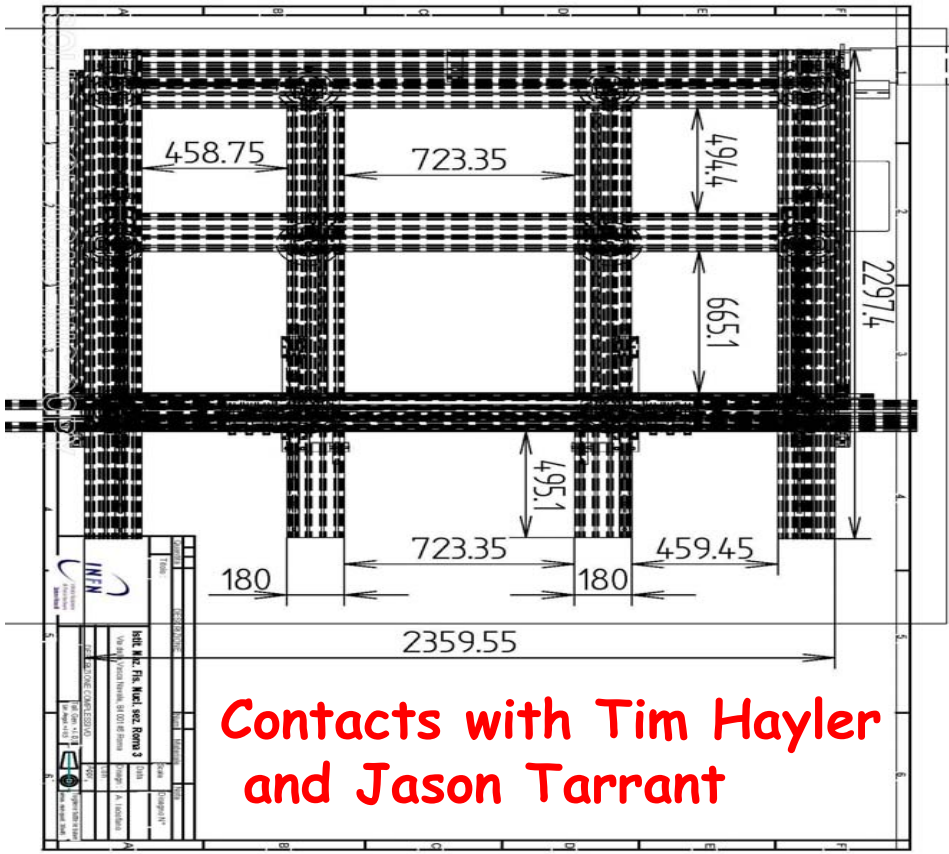




(definite reference points)

Trolley – top view for the Integration Engineering of the MICE Hall





Summary and next steps

- The KL detector is successfully working since **July 2008** showing a stable behaviour of all hw components (HV, PMTs, FEE, FADCs).
- Modifications of the downstream trolley for EMR integration have been discussed and partially planned.
- Most likely by the end of March we could be ready for the technical intervention to be performed later on and to be arranged with the TOF1 re-installation.