

ATLAS ITk Strip testbeam at SPS T4-H6 line

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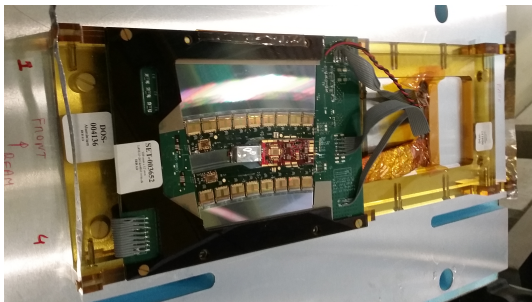
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Irradiation of the R0 module at CERN IRRAD

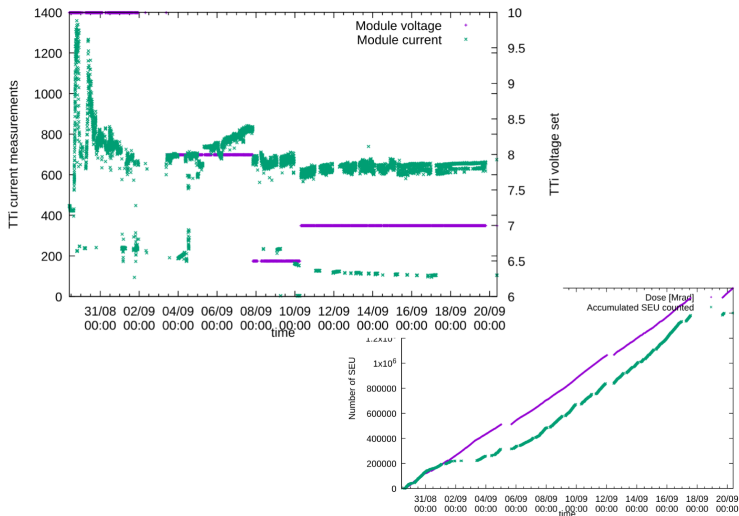
- The irradiation of the module was finished on September 21, the total delivered fluence is approx. 1.91×10^{15} p/cm² or 1.11×10^{15} n_{eq}/cm², the corresponding TID is 50 Mrad
- Activity of the module measured on October 3 was 300 μSv/h in contact - module was placed into the freezer, currently the activation of the module is low enough for safe testing



† All perspex holders were manufactured from completely transparent plastic.

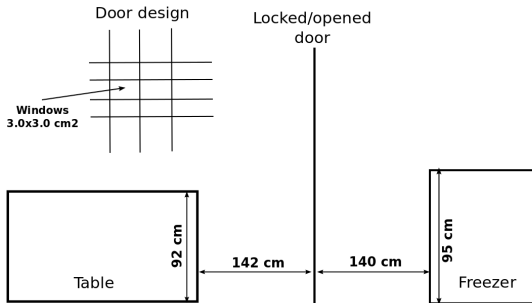
Studies done during the irradiation

- During the irradiation we have monitored several characteristics of the R0 module, results have been presented by Dennis Sperlich on the ATLAS ITk Week, please check the [presentation](#)



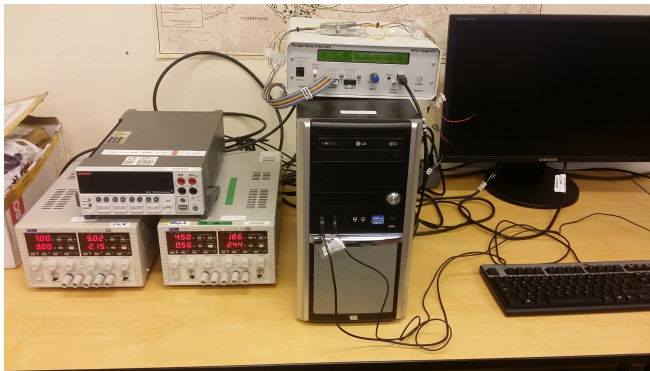
Testing of the R0 module before the SPS testbeam

- The functionality of irradiated and deactivated module will be tested before the SPS testbeam between October 29 and 30
 - we will use the freezer located at CERN IRRAD facility for this testing to avoid additional transport of the irradiated material
- Module (and cables used during the irradiation) should be transported between **157/R-060 buffer** and **887/R-C37 buffer** zones on Wednesday morning (official TREC request will be prepared)



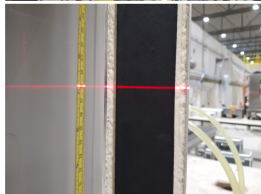
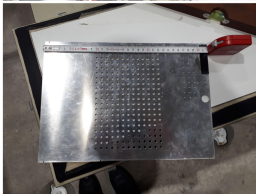
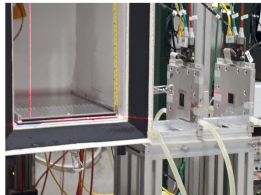
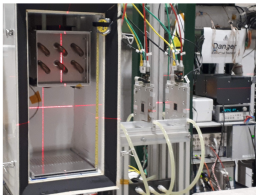
Measurement setup at SPS testbeam

- From the standard testbeam equipment we will use
 - EUDET Telescope with 6 Mimoso planes and 1 FE-I4 timing plane, TLU2 (sent from DESY), MPI cooling box with chiller, gaseous nitrogen to reduce RH
- We will bring
 - DUT PC and screen, remote control PC, two 2-channel TTI(s), one HV K2410, Cambridge Interlock and other arduino based T/RH monitoring systems, cables, etc. + module holder



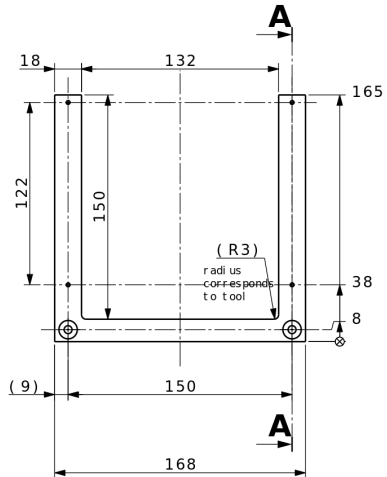
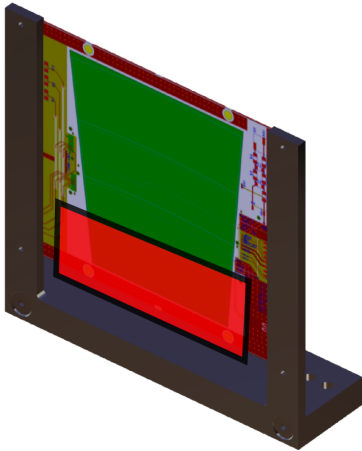
Module holder - MPI box measurements from Andre

- We have designed new module holder based on the information provided by Andre
- 0 mm height defined as the base plate of where the frame is to be mounted on
- Total usable height: 280 mm (290 mm if PT1000 is moved → to be avoided)
- Scannable height minimum (moving the box up): < 0 mm
- Scannable height maximum (moving the box down): 175 mm



Module holder

- New design of the module holder approved by Andre and manufactured at DESY Zeuthen



Summary

- The testbeam time at H6A line is scheduled between October 31 and November 7, beam scheduled from November 1
- Main goal is characterization of the R0 module irradiated to the total fluence expected to be delivered during the HL-LHC life
 - analysis will be focused on efficiency vs noise occupancy, tracking performance, charge collection, performance of specific detector components, dependence on bias voltage and temperature, etc.
- We will use standard EUDET Telescope system with Mimosa planes and FE-I4 timing plane, MPI cooling box with chiller, HV and LV power supplies, T/RH monitoring system
- More than 10 people will be available, 3 local shifts per day including nights are planned

