Preparation for Fall 2009 Test Beams

Introduction

There are three periods of test beams in which 3D sensors will be tested at CERN. This page contains a placeholder for notes/reminders for preparation.

MCC board

Description of the board and how to operate it here: MCC boards at SLAC.

Irradiation of 3D sensor on micro-carrier board in Birmingham

- Write action items **Philippe**

> *Dear Philippe,*
>
> *Two possible dates - 28th or 30 September. This is in first week of term, but as far as I can see I should have no teaching on those days and can do the dosimetry.*
>
> *The beam intensity can be anything from a few hits per sq. cm per sec to the full beam current. We have a 2 mm tungsten collimator hole (100 microns to 1 mm) with a tungsten scattering foil (25 microns upwards) which we use to blow the beam up to get uniformity and reduce the rate. The higest beam current is 30 microamp (2E14 per sec) over a disc of diameter 25 mm. It can be reduced to 0.1 nA and remain stable. It is best to use the scattering foil to ensure good uniformity over a sq cm area. I have many plots and figures that I will put together.*
>
> *Standard energy is 29 MeV - this will be 25 MeV if we use a scattering foil and put the samples in a cryostat. We have a portable cryostat that can cool the samples to -40 Centigrade if necessary.*
>
> *We can probably leave samples at Bormingham to cool. They might let us take them to Manchester if we bring suitable shielding for transport. Will have to check. Can send to CERN when they are cool enough for transport. Will have to check the rules on this.*
>
> *We will have to pay for the accelerator - 1000 pounds per day - so we should make sure we use the time well. Plenty of samples and measurements.*
>
> *If we had a readout system for the device, I can lower the beam rate to a few hits per sq cm so that pulse heights could be recorded - no trigger. Not sure we can get this ready in Manchester by this date.*
>
> *Best Regards,*
>
> *Steve*

Todo list

Hardware modifications on one or more TPLL for use with the EUDET telescope

- TPLL board from Manchester/Cinzia is at CERN and can be modified.
- Georg has all components at cern to do the modification

Suggestions is to modify one board that can be used with the EUDET all the time plus one spare. Proposed to make a new board but apparently there are new boards with strange problems according to Jens and so we need to modify an existing one.

Modification of the Oslo reconstruction code

According to Ole this is a very simple change to identify the chips.

Modify the BAT online monitoring

After discussion with Jens it seems like the best way to handle it is to modify the BAT online monitoring in order to keep TurboDaq software intact. We need to identify how the data stream from the module is read and identify how to separate up the chips. The online monitoring display should be re-usable. This also falls into the same logic as Goergs modifications of the eudet-MCC integration.

The work can hopefully be done by BAT expert or Pelle.

Implement the ATLAS module/MCC in the EUDET framework **Georg**

Current status (7/9/09) is that Georg has successfully read-out a module and also implemented this in the online software. Using a source one can see random correlations in the various chips. The method used is to separate the chips in the module streams in the online software.

The whole system (eudet+MCC) is according to Georg testable on a read-out chain without the actual telescope.

MCC tests at CERN **Alessandro & Pelle**

These tests will be started by Alessandro the week 31 Aug and continue the week after.

- Run source scan with >1 chip, moving the source over the chips to see hits in all attached chips for same source scan **Pelle & Alessandro**
- Run with BAT software after modification to check online monitoring
    - To see correlated plots we could either use cosmics with a stack of chips or a source. The latter option has the problem of penetration depth and the former has the problem of statistics?

DUT's & rough run plan

10-17 October

- List of devices under test
    - STA-3D (2E,3E and 4E?)
        - Check if the 2E and 4E can be revived **Pelle, Alessandro**
    - CNM
    - SINTEF
    - FBK (irradiated?)

Run plan
Should focus on measurements that require the extra resolutions

- Charge sharing
- Electrode charge collection efficiency

24-04 November

This assumes that we have access to the Morpurgo magnet.

- List of devices under test
    - STA-3D (2E,3E and 4E?)
    - CNM
    - SINTEF
    - FBK (irradiated?)

- Mounting (using BAT either in H6 or H8) **?**
    - Prefered choice: Use the cooling box prepared for EUDET TB period (above), needed if we test irradiated sensors
    - Backup choice is to use box from May if there is **NO**? required cooling

Run plan
Should focus on the measurements to validate the 3D performance and fill in the information we are lacking from the May TB.

- Angle scan
- Magnetic field strength scan

20-25 November

This period is in H6 without magnetic field.

DUT's

- List of devices under test
    - STA-3D (2E,3E and 4E?)
    - CNM
    - SINTEF
    - FBK (irradiated?)
- Mounting
    - Same comments as above.
    - Irradiated sensors should be available, see earlier comments on mounting

Run plan