

Minutes of WP-meeting 161

Attendance:

DESY: Ralf Diener, Astrid Münnich

Webex: David Attie, Gilles de Lentdecker, Jan Timmermans, Wenxin Wang

Arlington: Paul Colas, Jochen Kaminski, Martin Killenberg, Takeshi Matsuda, Felix Müller, Dan Peterson, Ron Settles

PCMAG/LP setup, test beam:

Ralf: PCMAG:

- Currently nothing can be done in the area or at PCMAG since CALICE is starting to set up its testbeam at T24 and data taking will start soon..

LP:

- The LP has been removed from the area and set up at the FLC-lab. The encap has been equipped with 7 dummy modules, flushed with T2K-gas and HV is applied to the cathode. During the HV-tests voltages of up to 18-19 kV without observing a higher current. This hints that the HV cable to the cathode is failing. A different one is used in the lab.

Test beam schedule:

- Ralf has not yet gotten any information on when the test beam will be available next year.

News from the groups:

Martin presented a few more results on the occupancy study for the CLIC-TPC. He showed some slides he had prepared for LCWS2012. He reported that the new implementation of the KalDet filter is finished. Now the KalDet filter takes the geometry and operation specific information from Gear. Now the processors have to be adapted. He that showed the occupancy plot in the TPC. For 1×6 mm² large pads, the voxel occupancy reaches up to 50 % close to the beam pipe and the cathode. For this study it was assumed that the shaping always covered 5 time slices and no electronic noise was considered. For pad rows above row 10 this value drops fast. Also, in the forward region the occupancy is reduced. It is therefore, still not clear whether it is better to increase the inner radius to remove the ions from the chamber, or to stay with the current size and to detect the tracks in the forward direction. Further detector studies have to show this. Alternatively Martin looked into decreasing the pad size to 1×4 mm² and 1×1 mm² pads. In this case the maximal occupancy reduces to 25 % and 12 % respectively. A great improvements would be to use an InGrid-base readout. In this case the occupancy would be 3 % for 200×200 μm^2 pixels, 2.4 % for 100×100 μm^2 pixels, 0.5 % for 55×55 μm^2 pixels. The small difference between the 200 μm and the 100 μm pixels indicate, that for the larger pixels there is a significant probability for 2 or more electrons hitting the same pixel. The reconstruction of physics events with pixel readout are however still too large to be processed.

Paul showed a few transparencies showing the newest results from the analysis of the 6 modules test beam campaign in July. He showed the residuals of all 72 pad rows from track fits to all three. There were large deviations of about 2 mm at the module borders. Paul showed that a significant part of the deviations could be interpreted as a rotation of -1.7mrad, 3.7 mrad and 8.4 mrad of each of the modules respectively together with a translation of 54 μm , 180 μm and 278 μm . Dan pointed out that rotations and translations of this magnitude should not be possible, because they would be larger than the gap between the modules would allow. Additionally, Paul suggested the magnetic field, which is inhomogeneous at the endplate and finally the gap between the modules are introducing an $E \times B$ -effect. It was suggested to look at data from a different drift distance. This should verify and determine

the influence of the inhomogeneous magnetic field. Dan pointed out that there was a larger gap between the module rows because the module rows of the LP have the same radii, but the centers are different and, therefore, gaps up to 4 mm instead of 1 mm exist. The DESY group will measure the gap sizes at the surplus endcap.

Takeshi showed some slides summarizing the field distortions observed with the Asia modules. He explained that the Asian modules have 4 metal posts to hold and contact a Gating GEM. To cover these posts an insulating frame was placed on top and some metal strips with resistors was placed on top, to form the electrical field. However, during the test beam the voltage was set wrongly and the observed track distortions (larger by about 50 % than Paul's were solarly attributed to the wrong voltage setting. Electric field simulations, however, could explain only half of the observed track distortions. Takeshi promised to look into the data again.

In a general discussion afterwards it was stated, that we need to include a magnetic field map into the track reconstruction, in particular the Kalman fitter. Martin reminded everyone, that Bo Li had tried to do this, but did not succeed, and that he had to leave for China again. But he will go to Japan next year and may have a chance to work with Keisuke on the Kalman filter.

AOB:

The next workpackage meeting will take place on November 8th.