Minutes of WP-meeting 170

Attendance:
DESY: Ralf Diener, Isa Heinze, Leif Jönsson
Fuzebox: Alain Bellerieve, Keisuke Fujii, Philippe Gros, Jochen Kaminski, Takeshi Matsuda, Dan Peterson, Ron Settles, Jan Timmermans, Wenxin Wang, Ryo Yonamine

PCMAG/LP setup, test beam:
Ralf: PCMAG/test beam area/LP:

- Everything is set up for the DESY test beam. This week, however, there is no beam because of a maintenance shut down.
- Cooling water has been installed inside the hut and the beam area. Soon the air conditioner will be installed in the hut, so that it will be cooler in summer. The cooling water in the area is for cooling the electronics.
- The ATLAS group, has not succeeded in operating one of the EUDET telescopes in the PCMAG. The noise was too high. They have another test beam later this year and will improve the setup until then (additional shielding, grounding,...). Then they will remeasure the momentum spectrum of the beam.

News from the groups:
Ralf reported on the DESY test beam. Everything had been set up in the FLC-lab and the field cage was tested up to 17 kV (corresponds to 240 V/cm). No discharges occurred, so the modification paid off. Then, the LP was moved back into the beam area and installed last week. Starting from Tuesday, the electronics was installed and a few test runs were taken from Thursday on. The working point of the GEM stack was determined. It is a bit lower than last year. The guard ring voltage was put to 50 V more negative than the shield. This decreased the efficiency loss of the first and last row of each module from 50% to 20%. The track distortions (S-shape of the residuals' means) was not influenced by the guard ring very strongly. However, they are still visible in the region between row 0 to 5 and 25 to 28. In the central region of the module the mean of the residuals is around zero and, therefore, shows that the GEAR file is correctly implemented. The analysis was done without any cuts and includes also tracks with large angles and low momentum.
Unfortunately, some of the connectors came lose and inefficient areas are visible at the occupancy plots. This is because the bars, pressing the connectors of the cables onto the connectors of the padplane were modified. During last years test beam the force exerted on the padplane was too strong and the padplane came off the backframe. Therefore, the bares were thinned to decrease the force. Obviously, they were decreased too much. During this week the electronics was disassembled and the bars were modified by adding a 100 µm layer of tape and a softer layer of foam material, which serves to spread the force evenly over all connectors in one row. The electronics will be remounted today and tomorrow and data taking will restart on Saturday with cosmic rays and on Monday with beam.
The noise was slightly higher than last year (0.8 vs 0.5 ADC counts), but this is still in the acceptable range. The fast analysis is using Klupatra now.

Philippe showed an update of the PRF and the cluster charge analysis of the December test beam campaign. The previous method of the PRF determination is to sum the charge of the 5 highest timeslices for getting the charge of each pad and then to determine the precise hit position in the pad

row via center of gravity. Finally, for every pad the distance of its center to the precise hit position and the pad's fraction of the total charge of the hit is calculated and histogramed. A Gaussian function is fitted to the distribution and the standard deviation increases with the drift distance as expected. Alternatively, he is using the ADC value of the pad. The results are very similar, but the diffusion coefficient is slightly lower (94 instead of 98 µm/√cm).
The charge per hit decreases by 20 % with the drift distance. To study this Philippe determined the charge in dependence on the drift distance with two methods. The first method is the total sum of the charge of the hit and the second one the product of the maximal ADC count and the standard deviation of the hit. This he compares with the maximal ADC count and the average charge of pads which are at various drift distances from the center of the hit. For B=0T he observes the aforementioned decrease in charge for the all the central pads, but for pads further from the hit center, he observes no decrease of charge. This indicates, that the charge is not lost because of attachment, since this would affect the all parts of the hit. For the outermost pads he even observes an increase in the charge for short drift distances. This is because the diffusion has not spread the charge enough so that these pads pass over the threshold. If the B=1 T is studied the threshold effect is increased, since the diffusion is suppressed by the magnetic field. It also contradicts the assumption that the threshold effect dis responsible for the 20 % decrease.

Dan asked, when the new space frame end plate could be sent to DESY and mounted on the LP. He pointed out, that his grant runs until end of August and that it is not clear, if he has travel money afterwards. So, he prefers a date before and will clarify this with Ralf.
A short discussion on the fiscal situation in the US followed. Dan explained that the budget of the NSF was slashed by 5 % by the budget sequestration. Current grants, however, will not be slashed. But Cornell, which gets most of its money from NSF, has to save the difference somewhere. If the situation continues, the real impact will be felt after 1st of September, when the new fiscal year starts and Dan's current grant will finish.
Alain asked who will attend the Snowmass premetings: There will be one meeting on Physics at the 3rd of April and one on instrumentation in Colorado also in April. But no one from the LCTPC community will attend the meetings, though from the physics side, many people interested in the ILC will attend.

Jochen summarized the status of the Bonn preparations for the test beam campaign end of March: For the triple GEM + 8 Timepix module all parts are in house and the assembly of the module has started. 2 octoboards have been equipped with bare Timepix chips and both boards have been proven to work. Threshold equalization and calibration also works for most chips. For the InGrid module a few parts are still missing, but are promised to be delivered next week. The octoboard has been mounted with 8 InGrids. All of them work electronically, but they haven't been tested with HV yet.

AOB:
The next workpackage meeting will take place on March 21st.