

Minutes of WP-meeting 374

Attendance:

Zoom: Ulrich Einhaus, Jochen Kaminski, Claus Kleinwort, Paul Malek, JShinya Narita, Huirong Qi, Oliver Schäfer, Ron Settles, Keita Yumino

General News:

Ron reported from yesterday's ILC-Europe meeting, that CERN is preparing a document to support the construction of the ILC Higgs factory and will include laboratories and universities in the community who wish to join the effort.

Huirong volunteered to give a presentation for LCTPC at the ECFA-workshop at DESY in October, and he will put a focus on the PID, which is important for the circular colliders CEPC or FCCee.

Uli gave a presentation on 'Simulation of a High Granularity TPC Readout' during the RD51 meeting on Wednesday last week. He was asked on short notice by Piet Verwilligen.

(https://indico.cern.ch/event/1138814/contributions/4921368/attachments/2462901/4222855/2022_06_15_RD51CollMeet.pdf)

PCMAG/LP setup, test beam:

Oliver: Test beam schedule:

- This week there is only one external group and two internal ones, but from next week on, the schedule is full until the summer shutdown.

News from the groups:

Huirong gave an overview talk, which was based on talks at the CEPC workshop, on the PID with cluster counting. He started with the expected energy distribution of hadrons at the CEPC for the interesting Z-decay channels needed for the Higgs reconstruction. The energy goes up to 20-40 GeV, while the one of muons is up to 100 GeV. This underlines the need for PID in this energy range. Huirong explained the benefit of the cluster counting method with respect to dE/dx . Then, he discussed the cluster counting in the time domain, as it is done in drift chambers. There was a simulation by Guang Zhao (IHEP) who simulated the signal output with the help of a Garfield++ simulations, the effect of the digitization and finally the reconstruction. With this simulation chain he studied different helium-based gas mixtures, various cell sizes and hadron momenta. A parameter set for the drift chambers could be found, which allows a K/π separation of more than 2σ for the relevant momentum range. An experimental test was done by Francesco Grancagnolo (INFN) with a prototype detector at the CERN test beam of which some results were shown. In the next part Huirong talked about the cluster counting in the space domain, which is done in TPCs. He introduced the dE/dx results of GEM group and also the simulation results of Uli. He also added a new study performed by himself, where the ionization clusters along a muon track are displayed and counted along the track. In this study he compared the dE/dx resolutions of different gas mixtures and gas pressures, but the study has just began and Huirong still wants to refine the method (e.g. introduce the separation power instead of dE/dx) and study more parameters. In the discussion it was agreed that a separate task force/working group or similar would be needed to study and compare different cluster counting algorithms

Oliver mentioned, that the gluing of the second LP field cage is well advanced. Last week the inner

layers (field cage foil, a kapton foil, a glass fiber mattress and the honeycomb layer) were glued and the rings were added. This week the outer layers (another glass fiber mattress, another kapton layer and an aluminized mylar foil) should be added. However, there are some problems, as the layers either wrinkle or do not stick very well. The glue layers are very thin (0.3mm) and worked well with the flat test samples, but because of the circular shape of the detector there are more challenges. Volker and Ole are working on this.

There were also several questions to Oliver about the IT. The svn-server will be switched of soon. As MarlinTPC is stored there, Oliver is working on transporting the directory to the git-repository. He can even preserve the structure and the history of the repository. There are still some problems as authors are identified by there account/email in svn and by real name and email address in git. As the email is disclosed publicly, there are issues with privacy rules. The second issue is, that indico will abolish the indico accounts. Then it can be access only by logging in with DESY accounts or Helmholtz-accounts. The confluence page is online again and can be accessed. It is occasionally shut down, if a security breach is found until a fix is available and installed.

AOB:

The next workpackage meeting will take place on July 7th.