

Minutes of WP-meeting 368

Attendance:

Zoom: Paul Colas, Ralf Diener, Ulrich Einhaus, Keisuke Fujii, Serguei Ganjour, Jochen Kaminski, Claus Kleinwort, Uwe Krämer, Jurina Nakajima, Shinya Narita, Huirong Qi, Ron Settles, Jan Timmermans

General News:

A general discussion on the feasibility of a TPC at future high rate colliders was started. Jan pointed out, that it would be difficult to operate a TPC at the CEPC, when operated at the Z-pole. He had uploaded a slide, where he gave the numbers and derived that about 60,000 Z0 would be produced per second in the current luminosity assumption. With a track multiplicity of 20 all being MIPs, this would result in an average ion density of 300 primary ions/cm³ not considering ions from the gas amplification stage. It is therefore not obvious, that a TPC would reach the required performance. ALICE is operating also in severe conditions, but their spatial resolution requirements are more relaxed than the ones of a Higgs factory. Keisuke was asked, if the code for calculating the field distortions was still available and compiling. Keisuke thinks so and has uploaded the code after the meeting to the indico page.

Huirong confirmed that the pixelTPC is still the first choice as a tracker for CEPC and that it is supported by Yfang, the director of IHEP. Jan estimated that the price of a GridPix readout including the electronics is about three times the price of the ASICs. This is not very expensive, but more problematic is the power consumption of about 2 W/chip currently. As there will be no power pulsing possible at the CEPC, this will lead to some challenges, but it would be the optimal solution for energies above the Z threshold.

The EIC detector concept ATHENA had also a small TPC with GridPix readout foreseen. But in a recent decision, the competing design ECCE was chosen. The reasons for this decision are not yet known.

Next meetings are

- 22.03. ILD Strategy discussion Part II
- 23.03. 10:00 EU ILC meeting at CERN
- 29. + 30.3. ICFA Meeting
- 05.04. ILD Strategy discussion Part III (Forward Calorimetry)
- 19.04. ILD Strategy discussion Part IV (Tracking)

The Snowmass White papers have been published on arXiv. Among others there is the one by Alain on MPGD TPCs and on ILC by Michael Peskin (> 300 pages).

News from the groups:

Jan mentioned that with the help of Uwe he succeeded to extract the trigger time stamps from the Mimosa data stream. They will now be used in the GridPix analysis to understand better the differences of the alignment and the measurements results.

Jan has uploaded and discussed some slides on the B-field map of PCMAG. He explained the content of the map (960 000 points!) and explained how to use it. He also showed, that there are significant (10-15%) inhomogeneities at different points ($r=0$, $r=\max$, etc.) along the z-axis. He has also written a

track extrapolation calculation , where the local track radius is determined in steps of 1 mm toy. Jan used this to estimate the effect of the inhomogeneities on the curvature of the tracks at different momenta.

Paul also showed some slides from the ongoing T2K analysis where the B-field inhomogeneities are also implemented now.

AOB:

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