

Minutes of WP-meeting 461

Attendance:

Zoom: Paul Colas, Ralf Diener, Ritsuya Hosokawa, Jochen Kaminski, Shinya Narita, Huirong Qi, Oliver Schäfer, Ron Settles, Jan Timmermans, Kanako Watanabe

General News:

There will be an ILD General Meeting from September 14th to 16th at CERN. Mary-Cruz asked for a premeeting (zoom) where she wants to talk about the TPC and the challenges. This will take place on Monday 7th of September from 14:00 to 16:00. We should prepare a plan what we need to study to validate the TPC option in both the Higgs running and the Z-running. If you have any ideas please send an email to Jochen or join the next meetings where the list will be discussed.

An example would be to study the new ion density and the possible corrections of the field distortions at the Z-pole. For simulations of unwanted backgrounds at accelerators Guinea-Pig has evolved into a new software program written mostly by a student of Jenny in collaboration with Daniel Jeans.

The DRD1 collaboration Meeting (<https://indico.cern.ch/event/1662850/>) in Coimbra was very nice but quite hot. Most of the times it was above 30° C, sometimes up to 35° C. Most talks were given by Italian RPC people. As this detector technology is cheap and needed for ATLAS and CMS, there is a lot of funding, but no exciting new ideas, except cylindrical RPCs for central tracking with a spatial resolution in the order of 1mm. As far as TPCs were concerned, there were some talks of WP8 on nuclear physics with active target TPCs.

LCWS was announced for 9th -13th of November at KEK (<https://agenda.linearcollider.org/event/11000/>).

There was a 5-day Conference on the Super Tau Charm Factory (STCF) in China, but no progress was reported. USTC staff will continue to work on it and push the STCF for the next (16th) 5-year plan from 2029 to 2035. Also, Ifang will pursue the R&D for a new ILD like detector concept for the FCCee and try to have Chinese participation either in the FCCee or to push the CEPC again for the next 5 year plan. Next week the Chinese HEP community will have a meeting on the future of HEP in China.

PCMAG/LP setup, test beam:

Oliver: PCMAG/TRACI/test beam area:

- 2 argon bottles have been returned to the central gas supply. They had been ordered to clean and dry the LP-TPC before filling it with T2K gas. But they had never been used.

Test beam schedule:

- Now there will be two weeks of summer shutdown, before beam returns until September. Oliver is involved again on Beamline for Schools (BL4S). The new project is on Cherenkov light in glass.

News from the groups:

Huirong gave a summary and a discussion of the implications of the latest results presented by Daniel Jeans during the FCCee week. He showed that there are huge backgrounds, which affects all subdetectors independent of the technology. The effect was also discussed during the WG1+WG2

DRD1 Workshop in June. The TPC suffers mostly because of the integration of ions in the drift volume, which leads to field distortions. Huirong showed that the tracks will look stiffer than without field distortions and will therefore suggest a higher momentum. Currently the various sources are being simulated both by Daniel Jeans and the group of Huirong. The contributions by single beam (beam strahlung, beam gas, etc.) are well understood, but the synchrotron radiation leads to enormous backgrounds several orders of magnitude too large. The low energy photons (< 10 MeV) are the highest contribution to the background, since they make pair production and the resulting electrons and positrons curl up and give a salt and pepper image in event pictures. The resulting space charge leads to the effect, that outer parts of the track are deviated further out, while inner parts of the track are pulled to the inside. Thus the curvature of tracks is decreased and the momentum stiffens if only TPC data is used for reconstruction.

Huirong also tested some ideas to reduce the background. He replaced the copper beampipe with an aluminum beampipe and added the stainless steel shielding by tungsten shielding of the same thickness. This decreased the number of low energetic photons by 85 %.

Xin She has finished her PhD and has received a fellowship at DESY. She will join Jenny's group to continue with simulating the effect of the high rate particle on detector performance.

AOB:

Volker Pohl, the DESY engineer, passed away on June 28th.

The next workpackage meeting will take place on July 23rd