Minutes of WP-meeting 414

Attendance:
Zoom: Paul Colas, Jochen Kaminski, Peter Kluit, Oliver Schäfer, Ron Settles, Jan Timmermans

General News:
Currently the 2024 European Edition of the International Workshop on the CEPC (https://indico.in2p3.fr/event/20053/) is closing. There were 173 participants, of which 80 were from China, 41 from France and 17 from Italy. There was a session on gaseous tracking on Wednesday morning. There were presentations by Huirong on the TPC, by Francesco Gravili on the IDEA Drift Chamber and by Mingyi Dong on the CEPC drift chamber. Paul presented the status and news on the T2K TPC.
Also many reports on progress of the MDI optimization and other advances were given. For example there are several PetaWatt lasers installed to also study plasma acceleration, which could be an option for the injectors of the CEPC.

News from the groups:
Peter showed some calculations he had done for the CEPC occupancy. Starting from the 18.2 k ions per bunch crossing and assuming a $1/R^2$ behavior he showed, that there will be 0.94 hits /µs/pixel for the inner radius of the CEPC-TPC, which results in an occupancy of 26%. Expected occupancies for larger pads (500x500µm² or even 1x6mm²) are much larger. The ratio of hits from Z decays to background is 1:52 => it is mandatory to reduce the background by optimizing the MDI, even though the GridPix could deal with it. Daniel Jeans could locate the main source of the backgrounds: backscattering from the LumiCals. To reduce the background Peter suggests to use a He or Ne based gas mixtures during the Tera-Z running. The cross section for background events is lower by a factor of 10 and the number of ions per event is reduced by another factor of 8. So in total 1/80 of the primary charge would be created. Peter showed the drift velocity and diffusion parameters in dependence on the electrical field. The spatial resolution would decrease by a factor of 1.5 to 2. This could be compensated by the exterior tracking detector. But the dN/dx and thus the PID could improve significantly.

Paul reported on the top T2K TPC. It has arrived in Tokyo. It could pass the custom within one day (compared to 14 days of the bottom TPC) and is now prepared for installation. Paul will travel to Japan in Mid-May to participate in the final commissioning phase. The data taking will then start mid of June.

AOB:
The next workpackage meeting will take place on April 25th.