

Minutes of the MPD Detector Advisory Committee (DAC) meeting of January 30, 2018 in VBLHEP, JINR.

The agenda of the meeting is under:

<http://indico.jinr.ru/conferenceDisplay.py?confId=426>

Present: Hans H. Gutbrod, Itzhak Tserruya, Luciano Musa, Nu Xu, and Hans Rudolf Schmidt via Vydio, and MPD Team

1. Status of the NICA-MPD project (V. Kekelidze, VBLHEP Director)

V. Kekelidze briefly overviewed the status of the MPD project and stressed the importance of the DAC activity in evaluating MPD TDRs. He informed that the sc-coil being built in Italy has suffered some delay. The planned transport on water before the ice builds up in the river Volga is now impossible in 2018. Delivery to Dubna is foreseen for Spring 2019.

2. Status of MPD TPC (S. Movchan, VBLHEP)

S. Movchan presented the status of the TDR for the MPD TPC. The MPD DAC notes with satisfaction the progress achieved after the recent evaluation of the TPC. The DAC is pleased to note the choice of the modern SAMPa chip for the TPC front-end and asks the team to perform the following actions with this FEE option:

- Finalizing of the TPC endcap design ASAP
- Study radiation tolerance and estimates of the radiation dose at the TPC endcaps
- Before beginning of the TPC FEE serial production, perform mock-up testing of a TPC sector with full set of electronics and service systems
- Provide MPD DAC with a more detailed time scale of the TPC commissioning process
- Study the possibility to exploit the cluster size to split extended clusters that do not exhibit two local maxima.
- Inform the DAC as soon as possible when CERN directorate allows purchase of SAMPa chip to JINR.

The DAC also recommends the TPC team to devote minimum efforts and resources to complete the characterization of alternative chips.

3. Recent progress in TPC tracking and MPD PID in Au+Au and p+p collisions (A. Zinchenko, K.Shtejer, A.Mudrokh, VBLHEP)

A.Zinchenko overviewed recent progress in MPD reconstruction including realistic TPC simulation. The results for the TPC tracking efficiency, momentum resolution, space resolution, two-hit resolution were shown together with selected results for invariant

mass reconstruction of Lambda-hyperons. The DAC noted with satisfaction the achieved progress; however, it also noted the fact that not all possible effects were taken into account. For example, noise in the TPC FEE and distortions were not estimated. The PAC asked for an explanation of the rapid decrease of the track pointing accuracy at low transverse momenta (slide 18, right plot). Nu Xu noted surprisingly small difference between the results for ideal PID and realistic PID in the invariant mass spectra of Lambda candidates (slide 21), which is not fully understood.

K. Shtejer presented the status of the MPD TPC simulation in p-p collisions. The PAC notes the achieved progress and recommended to continue this work. It also repeated that simulations should be done for low and high magnetic field

A.Mudrokh presented selected results about MPD PID performance in Au+Au collisions with the set of Stage'1 detectors (TPC+TOF). The DAC notes the results and asks the speaker to demonstrate the overall MPD efficiency in hadron yield measurements.

4. TOF TDR and answers to expert's questions (V.Babkin, VBLHEP)

V.Babkin presented the current status of the TOF TDR and answered to expert's questions. The discussed topics concern TOF efficiency, TOF occupancy in Au+Au collisions, and results for TPC-TOF matching. The DAC notes with satisfaction the answers and encourages the team to clarify remaining issues (English, typos, etc.), prepare the final version of the TOF TDR, and get the green light for mass-production.

5. Status of ECAL TDR and answers to Experts questions (I.Tyapkin, VBLHEP)

I.Tyapkin reported about the progress in ECAL TDR preparation. The discussed issues were: ECAL simulations, ECAL installation and estimated loads, ECAL timing resolution, and time table of the ECAL fabrication. The DAC urged the team to speed up the TDR preparation, especially to present as soon as possible a full simulation with the newly adopted pointing geometry of the ECAL. The physics performance of the ECAL must be shown for pi-zero detection and for gamma/pi-zero ratio as function of multiplicity.

The DAC strongly recommends the ECAL team to study the possible benefits of storing the time information of the ECAL and the associated cost increase.

Finally, a written commitment of the Chinese partners in due time would be beneficial for the project.