Minutes of the meeting 07.05.2014: analysis of time-like form factor measurements at PANDA

[1] Presence:
Alaa Dbeyssi, Dmitry Khaneft, Maria Carmen Mora Espi and Egle Tomasi-Gustafsson.

[2] Discussion on the different parametrizations for the pion cross section: Egle prepares a figure of comparison between the Regge model and the parametrization of reference "PRD 8, 287 (1973)".

[3] Egle prepares a figure for the effective proton form factor with a new fit compatible with the new BaBar data.

[4] According the expected counting rate in Tab. I, the simulation for the $\bar{p}p \to e^+e^-$ process will be done up to $s = 22.3$ GeV^2. Based on the output of this last point, the possibility to investigate the higher energy values will be studied.

[5] The analysis of the proton from factor measurements will be investigated with the full luminosity. A section and figure with error bars will be added to discuss the low luminosity effect.

[6] Discussion on the PANDARoot version which will be used for the new simulation: the difference between the different versions (nov12 (rev. 17878) , apr13 and scrut14) on the level of the reconstruction efficiency need to be understood (Alaa and Dmitry). Dmitry will check the results obtained by Alaa with the new PANDARoot version (scrut14, revision 24717).

[7] Background simulation: Alaa and Dmitry may prepare common code to generate the 10^8 events of pions at the three values of s-energy (5.4, 8.2 and 13.8 GeV^2). The generator developed by the Mainz group for $\bar{p}p \to \pi^+\pi^-$ will be used. The precise range of the angular distribution where the events need to be generated ($|\cos\theta| \leq 0.8$, 0.85 or 0.9) will be discussed in the next meeting.

[8] The materials (slides , minutes, ...) will be collected in a dedicated protected folder.

s [GeV/c]^2	p [GeV/c]	R	$\sigma(e^+e^-)$ [pb]	$N(e^+e^-)$	$\sigma(\pi^+\pi^-)$ [μb]	$N(\pi^+\pi^-)$	$\sigma(\pi^+\pi^-)/\sigma(e^+e^-)$
5.4	1.7	1	417.39	83.48 10^4 83.48 10^3	101.06	202.12 10^9 202.12 10^8	0.24 10^6
8.2	3.306	1	24.61	49.21 10^3 49.21 10^2	2.95	5.9 10^9 5.9 10^8	0.12 10^6
13.8	6.347	1	0.77	1538.16 153.82	0.16	3.18 10^8 3.18 10^7	0.21 10^6
16.7	7.906	1	21.35 10^{-2}	426.93 42.69	0.05	10.05 10^7 10.05 10^6	0.24 10^6
22.3	10.905	1	30.22 10^{-3}	60.43 6.04	0.01	2.05 10^7 2.05 10^6	0.34 10^6
24.35 $*$	12.	1	16.63 10^{-3}	33.25 3.33	0.67 10^{-2}	1.33 10^7 1.33 10^6	0.4 10^6
27.9 $*$	13.898	1	65.81 10^{-4}	13.16 1.32			

TABLE I: Total cross section integrated in the range $|\cos\theta| \leq 0.8$ and number of counts, for $\overline{p} + p \to e^+ + e^-$, $\overline{p} + p \to \pi^+ + \pi^-$, corresponding to an integrated luminosity $\mathcal{L} = 2$ fb^{-1} and $\mathcal{L} = 0.2$ fb^{-1}.