Version “diff\_v1\_v2.pdf”

**Abstract**

L11. The yield of Σ0 is…

* I think it would be better to mention its anti-particle
* E.g. The yield of Σ0 and its anti-particle is compared…

**1 Introduction**

L29. Baryons and their resonances

* Here we need definition of “resonances”

L32. In particular, Σ measurements

* “In particular” 🡪 “In addition”
* the Σ needs to be changed to Σ0

L34. Typo

* “Lambda” 🡪 “Λ”

L39. Usually this feed-down contribution is not considered for the Λ

* Is it true? Can we have reference from other experiments ?

L43. Furthermore the Σ0 production rates can be…. To correct pT-spectra of proton, pion and photon with ….

* If we don’t have reference, I would like to remove this sentence

L49. In this respect, the measurement of the pT-spectrum of Σ0 and the ratio

* Here anti- Σ0 is left out. I think it is better to introduce that Σ0 represent that sum of Σ0 and anti- Σ0 in introduction section. Or wrote them carefully to avoid omission

L53. In inelastic pp collisions at..

* In this version, “pp” collision or “proton-proton” collision is used to mention the collision system. (see line 29)
* I think it is better to unify the notation of collision system. Simply, we might use “pp” collision only.

**2 Experimental setup and event selection**

L65. Covering a pseudo-rapidity range of |η|<0.9

* I don’t think that the η range of ITS is limited by 0.9
* We need to check the η of SPD, SDD and SSD separately and provide the value correctly

L68. (DCA) of tracks to the primary vertex

- tracks 🡪 track

L69. A resolution better than 75 μm in the….[11]

* In the reference, the resolution of 75 μm is resolution of “rϕ” plane only. It doesn't covers resolution of “z”. Therefore, it would be better to specify that the resolution is related to only “rϕ” plane.

L70-71. TPC is a large (90m3)

* I would like to remove “large” and after the sentence I prefer to add reference.

L73-74. Spatial resolution of 500 μm …with η=0[10]

* I couldn’t find corresponding information from Ref. [10]

L76-77. in 2010 (only? Or – 2013) using a magnetic field of 0.5 T

* the data sample used in this draft was accumulated 2010
* I would remove the information of “magnetic filed of 0.5 T because it is already provided L63.

L83. estimated to be 85.2%.....uncertainty.

* We need reference after this sentence

L83. While SPD covers |η|<0.2, the two…

* I would like to remove “While SPD covers |η|<0.2”, since SPD information has already given in previous paragraph.

L85-95. Regarding beam-gas interactions and so on.

* I don’t think that we need to describe details on beam-gas interactions and beam-induced background in this paper. In my opinion, I would remove this paragraph but, if you think that we really need it, we have to rephrase.

L98. Required to have just one reconstructed primary…

* I think “just” is incorrect expression here. We need “at least” one primary. Isn’t it?

L98-99. Evens containing more than one distinct vertex are tagged as pileup

* We need to check the condition/definition of pileup for pp data obtained in 2010 to confirm it

L99-100. PV is determined by tracks in ITS and TPC and segments in SPD

* we need to check that TPC is used to determine PV or not
* SPD is one of components of ITS and therefore we may remove “segments….“

L103-109. Regarding questions from Prof. I.K. Yoo

* Since I have analyzed data sample of p—Pb and Pb—Pb and I haven’t used pp data sample yet, I am not aware about these value. Therefore I need time to digest them.

**3. Data analysis**

L112. The main feature of this decay is the low energy…

* I expect that the reason why Dr. Alexander Borissov added this sentence is to say about difficulty measuring low energy γ. Because the mass difference between Σ0 and Λ is small (~77MeV), the photon has to have small energy. In order to obtain the low energy γ, Dr. Alexander Borissov has studied detection of low energy γ with PHOS, EMCAL detectors as well as PCM method which is based on V0 information.

L113-114. The Photon Conversion Method (PCM) in the central tracking system was used for photon identification employing the ITS and the TPC.

* It is better to add algorism and or criteria of PCM shortly
* Does ITS really work for photon identification in the PCM? In the reference [9], corresponding information is written like that TPC reconstructs and identifies photons converted to e+e- pairs. Could one please check it?

L119 weak decay Λ(anti-Λ)🡪p(anti-p) + π+(π-)

* charge of π has to be changed. It is now written the other way

L131. V0γ from PV have to be larger than 5cm and smaller than 180cm

* Could you check the 5cm? I tried to find corresponding information in Analysis Note of Σ0, but there is no description about 5cm

L143. qT and α cuts value is written as opposite way

* 0.01 < qT < 0.17 and 0.2 < α < 0.9 for Λ, -0.9 < α < -0.2 for anti-Λ

Table1. wrong value

* same story with L143, check qT and α
* Could you please check the |η| cut for Λ? I think 0.5 cut is too tight and therefore I expect you might use 0.9 or 0.8

Line151. Typo on qT

* qT is written as pT

L160. The mean value of Σ0 the invariant masses from the fit…

* It would be better to rephrase. E.g. The mass of Σ0 obtained from Gaussian fit function…

L162. 2.2 MeV for 1.1 <pT < 1.6 and about 1.2 MeV for pT > 2 GeV

* I think we don’t need to give a value separately. We can write as 1.2 – 2.2 MeV/c

L160-165. Concerning the Mass and Width information

* Because we don’t provide the figure of mass, width as function of pT, we might remove this paragraph
* Note that, figure of mass and width as function of pT is shown in Analysis note. And mass looks like systematically above the 1192 MeV/c2
* When we upload the draft version of paper, the updated version of analysis note also should be uploaded at same time.

L166. Gaussian signal function

* signal 🡪 fit

L173. Correction factors are estimated from…

* estimated 🡪 calculated or obtained

L206. What is the V0Λ position?

Q. I guess you may perform the consistency check on systematic uncertainties, called as Barlow check. If you did, it is better to mention it shortly.

**4 Results and discussion**

L228. The corrected yield at mid-rapidity of Σ0 …

* I think it is better to rephrase. E.g. The corrected yield of Σ0 at mid-rapidity….

L233. The n, C and dN/dy, which represents the particle yield per unit of rapidity

* need short description for “n” and “C” as well.

L238. Levy-Tsallis fit for unmeasured range (pT<1.1 GeV/c)

* Did the function use only for low pT bin where there is no data points? Or does it apply for high pT reason as well? Please give full range of fit. I guess it might be 0-10 GeV/c
* We need to mention that the yield at high pT region can be negligible

Figure 4

* I don’t understand the caption “The ratio from the Levy-Tsallis curves based on Σ0 and Λ data…”
* Question: when you make a ratio and propagate the systematic error, you need to remove correlated systematic uncertainties of numerator and denominator. Otherwise, you take account the common error twice. Did you concern it?

**5. Conclusions**

L292. So far no generator is found to explain…

* I think we haven’t tested all generators. So this sentence needs to be rephrased