

- In the papers about “non-traditional” femto that we’re currently publishing, a point is made that we can do the measurement in pp collisions due to the smallness of the source. It would be good to make some mention in the introduction about why we expect to be able to measure the interaction and scattering parameters in PbPb collisions too.
- throughout the paper, be consistent about using ΛK or Λ -K (for all femtoscopic pairs)
- lines 42-43 : remove one “not” in “not previously not known”
- lines 70-71 : the inclusion of “central, semi-central, and minimum bias” doesn’t really make sense unless you explicitly introduce the idea of triggered data (since central and semi-central events are part of any minimum bias sample)
- line 73 : define the z position as being along the beam axis
- lines 74-75 : “the event must contain at least one particle of each type from the pair of interest” sounds like a tautology, at least for the same-event correlations, because if an event does not contain at least one of each particle type then it automatically doesn’t enter the correlation. If this is an additional condition that you impose on the events in the mixing pool, then this should be specified in the section about event mixing.
- line 83 : I think the specification of the pseudorapidity of the TPC and TOF is not necessary, since you don’t use tracks outside of $|\eta| < 0.8$ regardless of the PID. Instead, the η acceptance should be stated elsewhere where the general kinematic cuts are described.
- line 96 : established on \rightarrow established based on
- line 101 : is “methods” the right word here? All the PID is based on $N\sigma$ cuts
- line 108 : maybe add “due to their decay topology” after “ V^0 particles”, otherwise the definition sounds arbitrary
- line 110 : “exposed” is not the right word here
- Table 1 : for consistency in the notation, you can remove the $-$ and \pm signs in $N\sigma e^-$ and $N\sigma K^\pm$ in the “electron rejection” section
- Table 2 : for consistency in the notation, format $N_{\{\sigma_{\text{TPC}}\}}$ as $N_{\{\sigma p, \text{TPC}\}}$
- Figure 1 : I think that in ALICE publications we normally draw invariant mass plots with points including statistical error bars, not a connected line (but you could double check other papers)
- Figure 1 : It would be good to specify in each figure the pair (πp or $\pi\pi$), either in the x-axis as $m_{\{\pi p\}}$ and $m_{\{\pi\pi\}}$, or elsewhere
- lines 162-163 : I don’t understand the sentence “The constraint values used coincide with the values at which the average separation correlation functions stabilize to unity” (what are average separation correlation functions?)
- line 171 and Eq. 1 : should it be written $dN/d^3p_a d^3p_b$ or $d^6N/d^3p_a d^3p_b$? (similarly with dN/d^3p_a or d^3N/d^3p_a)
- line 194 : is pair transverse momentum (...) integrated \rightarrow is integrated in pair transverse momentum
- line 195 : limited data \rightarrow limited statistics

- lines 196-199 : the comment about the magnetic field seems out of place, would it be better to go in the systematic uncertainty section, or some other section which is more explicitly about the experimental setup?
- line 212 : “are the analytic functions” → what analytic functions?
- line 221 : finally observed → observed
- lines 222 and 285 : it’s always dangerous to write “assumed” in a scientific paper. Was this assumption checked? I could easily envision that it’s not true, for example if the kaon is actually a misidentified pion, and you’re measuring a $\Lambda\pi$ pair
- line 223 : pairs whose members originate as daughters from resonances → pairs in which one member originates from a resonance decay (right?)
- line 228 : finally measured → measured
- the notation of Eq. 6 and Eq. 7 is not consistent, because in Eq. 6 $\sum_{ij}\lambda_{ij}$ does not include the primary ΛK pair but in Eq. 7 it does (this is clarified in the text at line 235). Perhaps it would be clearer to just define $\sum_{ij}\lambda_{ij} + \lambda_{\{\Lambda K\}} = 1$, where $ij \neq \Lambda K$. Furthermore, would it be possible to remove the additional symbol λ' , by just including λ_{fit} in Eq. 6 explicitly?
- The fitting is mentioned many times throughout this paper, starting with line 237, but what is missing is an explicit statement “we fit the experimental correlation function”.
- line 241 : daughter → “daughters” or “daughter system”
- line 244 : it would be nice to have an example or examples like this (“e.g. ΣK ”) come earlier, in the paragraph around line 218, to help the reader
- lines 253-256 : I didn’t understand this section where line 253 says “experimental $\Xi^- K^\pm$ data are used” and then line 256 says “instead of using the experimental data”
- line 254 : $\Xi^- K^\pm$ the system → the $\Xi^- K^\pm$ system
- line 263 : p-p → pp
- in the paragraph around line 261, I would suggest making it clear that the reconstruction efficiency that we care about is that of the daughters under study, not the parent particles. For example, when discussing the contribution of ΞK to the ΛK correlation function, the reconstruction efficiency of the Ξ is not relevant but the reconstruction efficiency of the secondary Λ is.
- line 270 : if possible, try to avoid using two different definitions of the word “primary” in one line
- line 282 : τ_{max} is not defined, it should be in line 280
- line 287 : included → includes
- line 292 : 1.0 → 1
- Table 4 : is there any reason why the λ values for the different species (i.e. ΛK^+ vs anti- ΛK^-) should be different? Or are the deviations just due to the statistics of Terminator?
- lines 313-314 : “The behavior of the non-femtoscopic background is needed” is an odd formulation, actually what we need is an understanding of the non-femto background

- lines 317-320 : why is it necessary to describe something (weighting pairs by the wave function amplitude to introduce femto effects) that is not done in this analysis? I think these few sentences can be removed
- line 327-328 : I don't understand the phrase "application with the experimental data". Maybe this sentence is meant to say that before fitting the experimental data, the coefficients of each polynomial are fixed by fits to the Terminator background.
- line 333 : I think the sentence "the non-femtoscopic background correction was applied as a scale factor" is unclear. It's applied as a multiplicative factor to the entire correlation function during the fitting process, right?
- line 345 : scattering parameters unique from each other → unique scattering parameters
- line 347 : add R after "common radius parameter"
- line 352 : remove "and"
- No critique here, I just wanted to say I like Sec. 3.6. After a long detailed description of a complicated fitting procedure, I found the summary really helpful!
- remove and rephrase "residually"
- throughout the paper, and particularly in Sec. 3.6 it is not always clear whether the words "correlation function" refer to the experimental data points or to the fit function. I would prefer to keep "correlation function" referring only to the experimentally measured points, and find some other name for the fit function, but one could also rephrase things in a different way.
- Eq. 13 is a redefinition of $C_{\text{fit}}(k_{\text{rec}}^*)$ from Eq. 10
- Fig. 2 caption : I suggest combining the last two sentences: "This polynomial is shifted and scaled to match the experimental data and is drawn as a solid curve"
- Fig. 2 caption : define what the rows are (centrality bins)
- Fig. 2 : maybe instead of "ALICE bgd. fit" in the legend, what about "scaled bkd. fit"?
- Fig. 2 : it looks like only the lowest k^* bin has systematic uncertainties, or are they just smaller than the markers in all other bins?
- line 391 : $\&$ → \oplus (for consistency with other places in the paper)
- line 393 : receives → has
- in the figures, Λ is sometimes written in bold and sometimes in normal text, and is written in a different font than the rest of the text
- line 407 : the $\Lambda K^- \rightarrow \Lambda K^-$
- line 409 : remove "effect of the"
- lines 416-418 : make the typography of the pair types consistent with the rest of the paper ($K^-p \rightarrow K^-p$ or pK^-)
- line 418 : could be due to an effect arising from → could arise from
- line 423 : a type average → an average
- Fig. 5 : are the points from the ΛK analysis artificially offset in m_T for visibility? If so, it would be good to state this in the caption, or even remove the offset because none of the other systems are offset
- line 427 : remove "extracted"

- line 434 : I'm not sure how "good global m_T scaling is defined", so maybe just "global m_T scaling"?
- line 438 : how \rightarrow why
- line 442 : I found the phrase "not the pair sources" to be confusing, although I understood what was meant later in the paragraph. However, I'm not sure that expressing the difference between, for example, KK and Λ K femtoscopy, in this way is effective. Femtoscopy is always in some sense a pairwise effect, and so in the case of identical particle femtoscopy it's just that the single-particle source is the same as the pair source, right?
- Table 6 : $\&$ \rightarrow \oplus (for consistency with other places in the paper)
- line 483 : for each system \rightarrow present in each system
- to make the final sentence of the paper stronger, and so that all the major conclusions of the paper are included in the summary, you could add "which is confirmed by the spherical harmonics decomposition of the correlation functions" at the end
- line 595 : transition \rightarrow transformation