From: **Jörg Gayler** joerg_gayler@yahoo.de
Subject: [h1zeus-herapdf-nnlojet] Combined H1/ZEUS paper on NNLO PDFs using jet data:
Date: 19. August 2020 at 10:02
To: h1zeus-herapdf-nnlojet@desy.de

JG

Dear editors of the combined H1/ZEUS paper on NNLO PDFs using jet data

Comments to v0.5 July 27

Thank you very much for these efforts for final words of the two collaborations.

Significant: I list here all questions that are not just wording only.
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General: I miss a bit a general outline of the fit procedure.
We determine alpha_s and PDFs. In the introduction one learns that we determine both simultaneously. Then in 3.1 to 3.4 nothing is said on alpha_s. Then alpha_s is determined fitting also pdfs, but discussed only in context of scaling violations. And then alpha_s is unexpectedly fixed to determine pdfs which one had assumed to have been already determined together with alpha_s. To understand the paper more easily, I would like to have some guidance early on.

Comparisons with other results in section 4.1 is a bit meager, showing only the level of consistency, if data are treated similarly. But the difference of the Results or the agreement is of interest in first place. The paper could also compare the result to other important analyses in different reactions. What is the relevance of the result on alpha_s?

Comments in detail:

3.1 Choice ..
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127 "extra parameters .. one at a time": Is there some arbitrariness in which sequence the further parameters were chosen? Is the actual choice of parameters depending on the sequence?

3.2. Model ..

What is done with alpha_s in these PDF fits?

Or the other way round, one wonders whether these variations lead only to uncertainties on the PDFs and not on alpha_s. In the introduction it is said, that fitted together.

153 what determined the variation of mu^2_f0?

3.3
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175 Here in 3.3 alpha_s is mentioned. But what in 3.2? I already asked there.

191 but mu_f0 = sqrt(1.6) = 1.26 < 1.37. One could check and state what happens then.

4
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228 I guess (2,0 mu_r, 1,0 mu_F)

4.1

269-277 The reader ist not so much interested whether data agree, if treated the same way, but at least as much whether the results are very different or not if different assumptions are used. So the main results as they were presented should be compared as well.

282 Again the main focus seems to be on trying to do the same.

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305 if mentioned, what was then actually done, which scale variations assumed, as for the alpha_s fit?

318-320 "The reduction in model and parameterisation uncertainty ... mostly due to the necessity to change the estimation procedure." What does this mean? Understandable? Further discussion is rather technical. I would expect some words on the actual observations, like that the largest effect is seen at large x. Is it really significant as it appears to be?

Minor:

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Abstract
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24 "Predictions": a bit much, as fitted to these data. Suggest: calculated cross sections

Data
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73 "excluded for several reasons, including..."Sounds as if there would be more reasons than explained. May be "for several reasons: to ensure ..."

3.2
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153 "was added to the parameterization uncertainty". But there is nothing yet to add on. The reader thinks to have missed something.

3.3
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165 parameterS

178 As I understand, it is more clear to say: "one of the mass-parameter values. ... was used ...

182 Is it obvious, the the M_b plot demonstrates the power of the method? Is it, because we get a parabola?

241 where is equation 7?

4.
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264 multiplied into the .. gluon term. Is this just a factor (1 + Dx)? Is this a clear wording at least for natives?

4.1

278-280 Reads strange: first it is said that H1 and NNLOJet analyses were done using fixed PDFs. Next sentence a simultaneous fit of alpha_s and PDFs.

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321. IN section 3.3

References

Ref. 2
Was there some agreement on the sequence: "ZEUS and H1"? Why not alphabetical?

Ref 36 (2019) ---> (2017)

All the best, Joerg