

Dear Referee,

thank you for reviewing our paper.

The paper presents the first measurement of photon production in ep collisions in the very forward region. As such, I recommend that it is published provided that the authors address the following issues:

(A) Except for constraining the fragmentation functions, the authors claim that their results are important for understanding high energy cosmic ray data. For this reason it is required, in section 2.4, to give more details on the 'physics' which is included in the relevant MC programs such as EPOS, QGSJET 01/II and SIBYLL. Describe also the differences between them.

>>> We have modified the 3rd paragraph in section 2.4. and added some more details on the models. However, we don't enter an in-depth discussion of the differences among the models because with this analysis we are not able to pin-down the reason for the failure of one or the model in describing our data.

(B) In the results section reference is made to the LHCf paper. In this paper QGSJET and EPOS underestimate the data at high energy while SIBYLL overestimate the data. However, at lower energy QGSJET and EPOS overestimate the data which is what H1 also observes. I would have expected a more in-depth discussion of the comparison between H1 and LHCf rather than simply saying that the two are in different kinematic ranges and no comparison can be made.

>>> The comparison of the data is not possible because of different phase space regions explored by LHCf and H1 and the LHCf experiment has published only uncorrected yields in figures. Even if the two data set would be sensitive to the same phase space a comparison of the data would not be possible because of missing (corrected) numbers from the LHCf experiment.

The LHCf paper does not discuss very much the description of the data by the models. Since they don't give an interpretation of their data an in-depth comparison of the agreement/disagreement of the models with the LHCf data and our data cannot be made. Especially due to the fact that in the revised version of the LHCf preprint some of the theory curves in the main figure (fig 4) have changed significantly we think it is not wise to do such a comparison before their data are published in a journal.

(C) In the summary section towards the end: 'All these models predict different spectra in xL and pT'. This statement is not very useful. Of course they are different but what does this mean? In the very next sentence it would be useful if you could quote the disagreement in %.

>>> We added a sentence about the normalisation difference between data and models.

Also please correct the following:

(1) Introduction – Line 3: '....understanding of proton fragmentation'. Give a references.

>>> we have changed the text to make it clear that we are talking about the fragmentation of the proton remnant.

(2) Introduction – Line 6: '...cosmic ray data'. Give references.

>>> references have been added

(3) Introduction – Second paragraph. Make clear that you are referring to this specific measurement. 'The measurement of the photon production...'

>>> This is a general statement. We also refer to the previous measurements at SPS and LHC. We are more specific about the current analysis in the second but next sentence in this paragraph.

(4) Monte Carlo section (page 8) second paragraph: 'The DJANGO.... ' change 'generates' with 'generate'.

>>> Thank you for spotting this.

(5) Monte Carlo Section (page 9) line 1: 'QGSJET II' -> 'QGSJET II-03'

>>> changed

(6) Results section (page 11) line 2: 'The QGSJET model predicts slightly softer....'
Change 'slightly' to something more quantitative...

>>> the text has been changed

(7) Several of the figure captions start with very long sentences. It would be worth rewriting them so that they read better.

>>> the sentences at the beginning of the figure captions have been changed.

(8) Figure 6, caption: 'The inner error bars shows...' No inner or outer error bars are visible. Also 'shows' -> 'show

>>> Thank you for spotting it.