Dear Editor:

Please find here the revised version of the paper, that we kindly ask you to consider for publication. All the recommendations and suggestions from the referee report were addressed.

Letter to the Referee:

We are thankful to the referee for the detailed analysis which motivate to improve the manuscript. In what follows, after quoting each part of the report, we present our comments and changes in this revised version.

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"1. The considered elastic, total, and diffractive cross sections are by far dominated by soft, non-perturbative physics. Therefore, the connection to perturbative QCD and the parton language is masked by non-perturbative effects. It should be explained and emphasized in the paper."

We agree with the referee that the nonperturbative physics plays a crucial part in the description of hadronic cross section. This aspect have been emphasized in the paragraph below Eq. (37).

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"2. The related question is the magnitude of σ_{pQCD} ***in eq.38. How large is its contribution to*** σ_{eik}***? I expect that it contributes only a few percent. As a result, the sensitivity to the factor of K introduced by eq.39 should be very small. I think it is important to explain and discuss these points."***

In order to clarify the magnitude of the perturbative component of σ_{eik} we have included a new figure in the manuscript (Fig. 1). A discussion about the importance of this component for high energies have been addressed in the second paragraph of Sec. III. The justification of our analysis considering different values of the K factor is also presented.

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"3. Is there any physical motivation for the used models of the distributions $p(\alpha)$ ***in eq.31 and the average number of interactions*** $\langle n(s,b)\rangle$ ***in eq.37? In my opinion, it is not enough to simply write "we assume" without giving any reasoning why such an Anzatz could be appropriate and what physics it captures."***

We thank the referee for raising these points which motivated to improve our discussion about these two important quantities present in our model. Regarding $p(\alpha)$, we have clarified our choice in the paragraph below Eq. (30). A more detailed discussion about $\langle n(s,b)\rangle$ was included in the paragraph above Eq. (37).

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"4. The free parameters in table I are fitted to the available data on the total cross section. It is known very well that the total cross section is only weakly sensitive to Good-Walker fluctuations since they average at the amplitude level, see eq. 21. In particular, the total cross section does not constrain the dispersion of the distribution $p(\alpha)$***. Hence, it is not clear how fixing the model parameters using the total cross section, one can make reliable predictions for the diffractive cross sections, which are sensitive to the dispersion of the distribution*** $p(\alpha)$***. It needs to be explained."***

We agree with the referee that σ_{tot} may not be the best physical quantity to constrain the variance

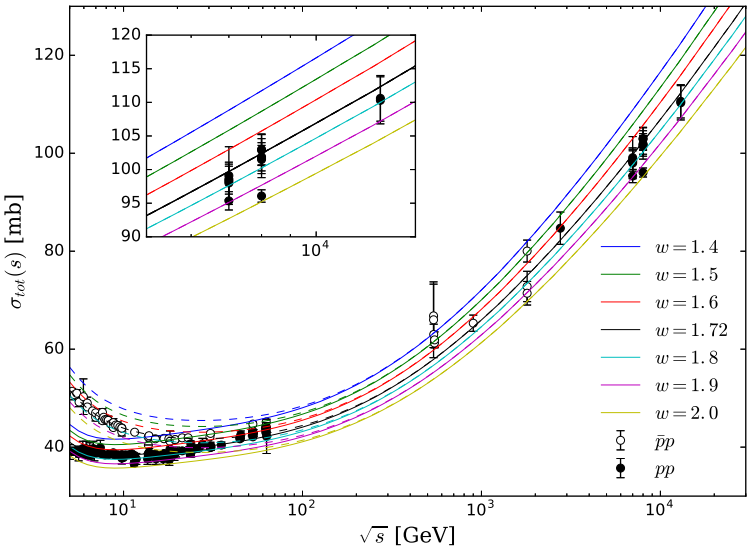

Figure 1: Effect of w in the total cross section.

of $p(\alpha)$. However, σ_{tot} consists of one of the best dataset available, considering the large energy range covered and the precision of the data. An alternative could be σ_{SD}, but the current experimental data have a large uncertainty. We have checked the sensitive of σ_{tot} to the description of $p(\alpha)$, by estimating the total cross section assuming different values of the parameter w, while keeping fixed the other parameters that determine the soft cross section. As demonstrated in Fig. 1 of this report, the description of σ_{tot} is sensitive to w and, therefore, to the description of $p(\alpha)$. In order to clarify this point, we have included a comment in the first paragraph of Sec. III.

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"5. What is the reason for setting the subtraction constant $C = 0$ ***in eq.41?"***

A more detailed discussion about the subtraction constant was included in the paragraph below Eq. (43).

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"6. The discrepancy between the theory description and the data in fig. 4 requires more discussion. For instance, how can the model be improved to provide a better description? What does it tell us about the physics of the proposed model?"

A more detailed discussion about these topics was included in the last paragraph of Sec. III, where we have clarified how the model can be improved.

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Sincerely yours,

M. Broilo, V.P. Gonçalves and P.V.R.G. Silva.
V.P. Gonçalves (by the authors).