

We are thankful to the reviewer for the detailed analysis and the important points raised on our submitted work. In what follows, after quoting each part of the report, we present our comments and changes in this revised version. We advance that the inclusion of the replacement $s \rightarrow -is$ in the semihard form factor leads to a completely different scenario.

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“1. To restore the real part of the amplitude authors replace 's' by '-is' in eq.s(10) and (14). (paragraph after eq.(16)). Indeed, such a replacement should give the result close to that obtained from the dispersion relation. The problem is that, most probably, the replacement $s \rightarrow -is$ was not implemented for ν_{SH} in eq.(13) which also contains the $\ln(s)$. By this reason (I think) the resulting value of $\rho = Re/Im$ becomes noticeably smaller than that given by dispersion relations with σ_{tot} corresponding to the curve in Fig.1.

Also it looks strange that at $\sqrt{s}=541$ GeV authors get the value of ρ noticeably smaller than that measured by UA4/2. Normal dispersion relations (without the Odderon) gives $\rho(\sqrt{s}=541\text{GeV})$ consistent with the UA4/2 value.

Note that in a more detailed, arXiv:1906.05932, version of this work the fit with $\nu_{SH} = \nu_1 = \text{const}$ (Fig.8) gives at 13 TeV a smaller σ_{tot} and a larger ρ . Moreover, in this case we see the correct behaviour of ρ – model based on MMHT partons predicts a faster increase of σ_{tot} with energy and a larger ρ . On the other hand including the non zero coefficient ν_2 in $\nu_{SH} = \nu_1 - \nu_2 \ln(s/s_0)$ authors obtain a smaller ρ for the partons which provides a faster growth of σ_{tot} (see e.g. Fig.7). Thus authors must to include the $s \rightarrow -is$ replacement in ν_{SH} and to explain how this replacement was implemented in (10) where 's' enters only through the inequality $x_1 * x_2 * s > 2|t|$.”

- Comments/changes

First, respect the SH form factor, we have included the replacement $s \rightarrow -is$ in ν_{SH} too. The results are presented in Table I and Figures 1 and 2. They are not consistent with our previous results, leading to a completely different scenario and different conclusions: the TOTEM data at 13 TeV are not described by this version of the model. This may suggest the inclusion of a Odderon contribution, which, if the referee agree, we would like to implement in a forthcoming work.

In this respect the changes that follow have been performed in the text.

- We inform the above replacement in the text in page 3, left column, 4th line after Eq. (16):

“.... throughout Eqs. (10), (13) and (14)...”

in place of

“... throughout Eqs. (10) and (14)...”

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Second, respect the implementation of the replacement $s \rightarrow -is$ in eq. (10) we have included the following paragraph at the end of of our section *Introduction* (page 3, end of the left column):

“Specifically, in case of the $\sigma_{QCD}(s)$, Eq. (10), we first consider the following real parametrization

$$\begin{aligned} \sigma_{QCD}(s) = & b_1 + b_2 e^{b_3[X(s)]^{1.01} b_4} \\ & + b_5 e^{b_6[X(s)]^{1.05} b_7} + b_8 e^{b_9[X(s)]^{1.09} b_{10}}, \end{aligned} \quad (1)$$

where $X(s) = \ln \ln(s)$ and b_1, \dots, b_{10} are free fit parameters. The $Re \sigma_{QCD}(s)$ and $Im \sigma_{QCD}(s)$ are obtained through the even substitution $s \rightarrow -is$. Next we generate around 30 points using PDF CT14, which are then fitted by $Re \sigma_{QCD}(s)$ with less than 1% error. The data reduction yielded: $b_1 = 100.220 \text{ GeV}^{-2}$, $b_2 = 0.434 \times 10^{-1} \text{ GeV}^{-2}$, $b_3 = 1.274$, $b_4 = 1.919$, $b_5 = 0.122 \times 10^{-7}$, $b_6 = 14.050$, $b_7 = 0.504$, $b_8 = 3.699 \times 10^3$, $b_9 = -80.280$, $b_{10} = -2.632$.”

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”2. With $\mu^+ = \text{const}$ (as in Table 1) we can not expect the $\ln^2(s)$ growth of χ_{soft}^+ with energy (as in (14)). This $\ln^2(s)$ behaviour usually was obtained after the eikonalization. Better to assume the small power dependence $\chi_{soft}^+ \propto s^\lambda$. Otherwise the $\ln^2(s)$ behaviour should be motivated.”

- Comments/changes

The $\ln^2(s)$ behavior was motivated by the recent forward amplitude analysis by Broilo, Luna, Menon (Phys. Lett. B 781, 616 (2018) and Phys Rev D 98, 074012 (2018)) in which the triple pole dominance has been selected as the best leading contribution in the description of pp and $\bar{p}p$ data. Moreover, this contribution also lead to the best results in the context of our QCD-based model. We added the following sentence after Eq. (16), providing citation of the above papers (present in ref [15]):

“We notice that the $\ln^2(\tilde{s})$ contribution in Eq. (14) was motivated by the recent forward amplitude analyses by Broilo, Luna and Menon [15], in which the triple pole has been selected as the best leading contribution in the description of pp and $\bar{p}p$ data up to 13 TeV.”

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”Minor comments:

3. At the end of 1st paragraph in sect.1 the reference to BFKL papers should be added (say, to Ref. [9])”

- Changes

We have introduced the following references, after previous ref. [9]:

L.N. Lipatov, Sov. J. Nucl. Phys. 23 (1976) 338;
E.A. Kuraev, L.N. Lipatov and V.S. Fadin, Sov. Phys. JETP 44 (1976) 443;
E.A. Kuraev, L.N. Lipatov and V.S. Fadin, Sov. Phys. JETP 45 (1977) 199;
Ya. Balitskii and L.N. Lipatov, Sov. J. Nucl. Phys. 28 (1978) 822.

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”4. It would be good to calculate (and to present) the elastic t-slope, $B_{el}(t=0)$, corresponding to proposed model. Since the b-dependence of the amplitude is written explicitly it will be easy to compute $B_{el}(t=0)$.”

- Comments

We understand that, although the limit $t \rightarrow 0$ can be evaluated in a phenomenological model, the experimental values of the slope B_{el} are not a forward quantity, since they are measured in a finite region of momentum transfer. Moreover, this region of measurement (position and extremes) are different from experiment to experiment. For that reason and following the first two recent papers by Martynov and Nicolescu on the Odderon, we have focused only on the strictly forward scattering, namely total cross section and rho parameter. However, it is our present task to extend the formalism to quantities beyond the forward direction.