Erratum

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Erratum to: Total pion-proton cross section from the new LHCf data on leading neutrons spectra

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The LHCf data on $d\sigma_n/dE_n$ were considered in three rapidity ranges:

$$\eta > 10.76, \ 8.99 < \eta < 9.22, \ 8.81 < \eta < 8.99.$$
 (1)

On the page 3 of the article it was written, that we can use second and third regions, since |t| values in these regions are of the order of m_{π}^2 . This is not correct, since $|t| \sim 0.4 \rightarrow 1 \text{ GeV}^2$. In calculations of the Table 1 edge values of physical region in |t| were used in the computer program instead of real |t| values by mistake.

After more rigorous analysis resuls are following:

- we have to use the first region, where $\eta > 10.76$ and real |t| values are of the order of m_{π}^2 ;
- in the article Figs. 3, 6 and the Table 1 should be replaced by new ones (see below).

Additional errors in $\sigma_{\pi p}$ due to model dependance in the background estimations are not taken into account.



Fig. 3 Rescattering corrections multiplied by formfactors for $\sqrt{s} = 7 \text{ TeV} (\tilde{S}(s, \xi))$ integrated in the whole *t* regions of the LHCf data [19]: $\eta > 10.76$. Dotted vertical lines mark $\xi = 0.107, 0.179, 0.25$, which are used to extract $\sigma_{\pi p}$ cross-sections



Fig. 6 Extracted total $\pi^+ p$ cross-sections presented in the Table 1 versus different parametrizations: [34] (solid), [35] (dashed), [36] (dotted) and [37, 38] (dash-dotted). The interval of *t* related to the η region of the LHCf is $\eta > 10.76$

Table 1 Values of the πp total cross-sections extracted from the LHCf data [19] and also depicted in the Fig. 6. Corresponding average |t| values and q_0 ($q_t < q_0$) are also shown. Backgrounds from ρ and a_2 exchanges are taken into account

\sqrt{s} , TeV	$\sqrt{ t }/m_{\pi}$	q_0, GeV	$\sigma_{\pi p}^{\text{tot}}, \text{mb}$
2.291 ± 0.382	0.91 ± 0.29	0.132	33.15 ± 13.1
2.958 ± 0.296	1.41 ± 0.166	0.12	40.22 ± 7.76
3.5 ± 0.25	1.99 ± 0.11	0.112	65.43 ± 15.15

The original article can be found online at https://doi.org/10.1140/epjc/s10052-017-4690-3.

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