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Erratum: Measurements of prompt charm production cross-sections in pp collisions at $\sqrt{s} = 13$ TeV

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Two issues have been identified in the calculation of the D^0 efficiency, which affects the published D^0 cross-section measurements from pp collisions at $\sqrt{s} = 13\,\text{TeV}$ [1]. What follows is a brief description of the nature of these problems, before the corrected results are given.

To save computing resources, simulated events are only propagated through the full simulation of the LHCb detector if all charged final state particles are within the geometrical acceptance, defined to be $10 < \theta < 400\,\text{mrad}$ in the polar angle. The efficiency for this requirement is estimated from dedicated simulated samples with the requirement omitted, and which are not propagated through the detector simulation.

As the efficiencies for configurations with all particles inside the acceptance are determined differentially in bins of meson (p_{T}, y), it is sufficient to create a sample of $D^{*+} \to D^0\pi^+$, with $D^0 \to K^-\pi^+$ to evaluate both the $D^{*+} \to D^0\pi^+$ and the $D^0 \to K^-\pi^+$ efficiencies. A mistake was made in computing the D^0 efficiency in that also here the angular requirement on the soft pion from the D^{*+} was included. This has now been corrected, most notably leading to a decrease of the measured cross-section in the range $0 \leq p_{\text{T}} < 1$ GeV/c for large values of y.

The second issue was a bug in the coarse-graining of the fine binning used in the simulation to the final bins used for the published numbers. The effect was small, mainly affecting the low-p_{T} bins, but resulted in a slight underestimate of the D^0 cross-section.

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Having resolved both issues, the corrected numbers for the integrated D^0 and the estimated $c\bar{c}$ cross-section are:

$$\sigma(pp \to D^0 X)_{1 < p_{\mathrm{T}} < 8\ \mathrm{GeV/c},\, 2.0 < y < 4.5} = 2470 \pm 3 \pm 130\,\mu\mathrm{b},$$
$$\sigma(pp \to c\bar{c} X)_{p_{\mathrm{T}} < 8\ \mathrm{GeV/c},\, 2.0 < y < 4.5} = 2840 \pm 3 \pm 170 \pm 150\,\mu\mathrm{b}.$$

All tables and figures in which the measurements are affected are given below, with the numbering and captions being identical to those in the original paper. Based on the corrected 13 over 7 TeV ratio for D^0 shown in figure 7, the statement "the agreement worsens with increasing rapidity for low p_{T}", given on page 18 of the published paper, is no longer supported.

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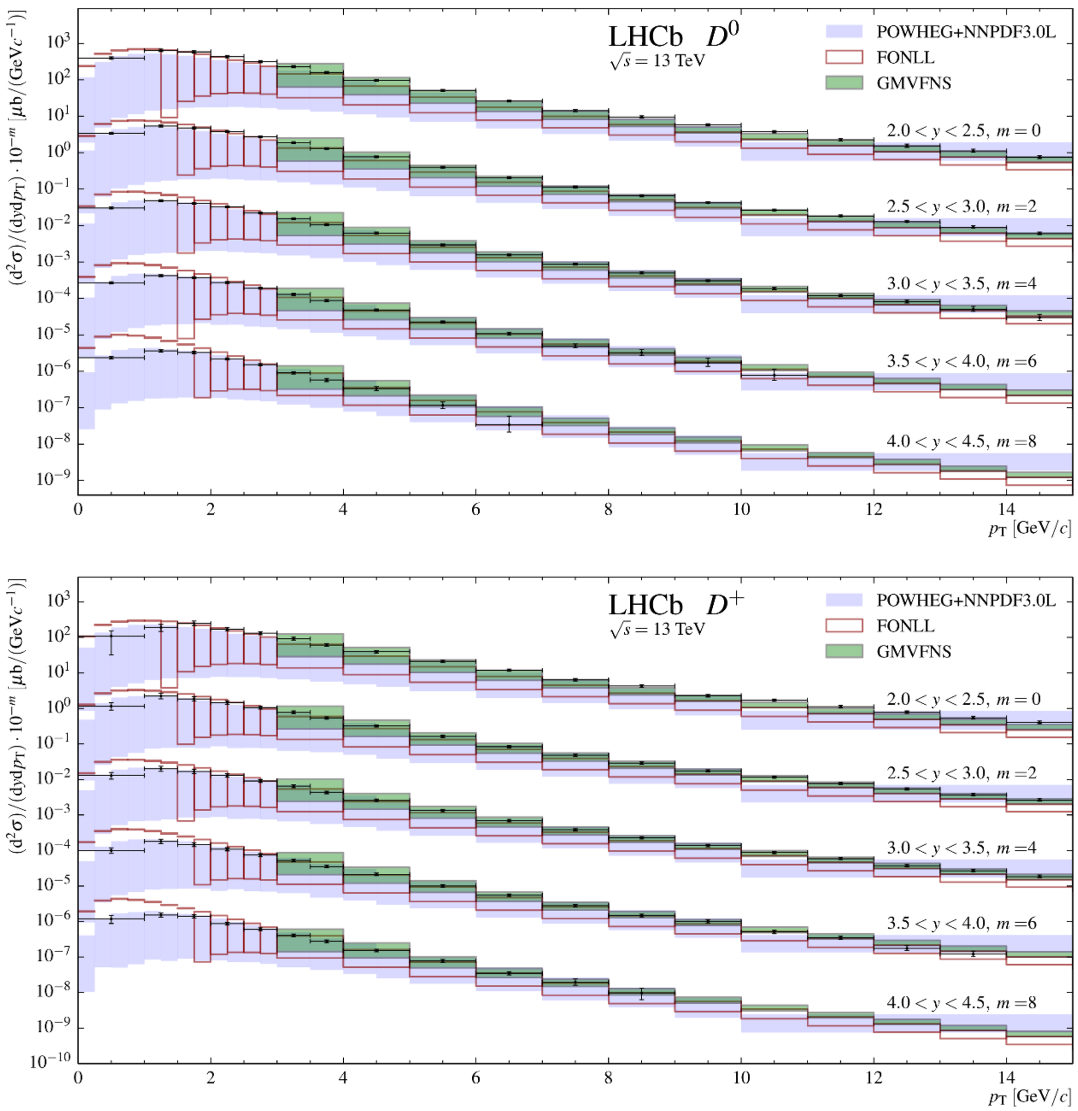

Figure 5. Measurements and predictions for the absolute prompt (top) D^0, and (bottom) D^+ cross-sections at $\sqrt{s} = 13\,\text{TeV}$. Each set of measurements and predictions in a given rapidity bin is offset by a multiplicative factor 10^{-m}, where the factor m is shown on the plots. The boxes indicate the $\pm 1\sigma$ uncertainty band on the theory predictions. In cases where this band spans more than two orders of magnitude only its upper edge is indicated.

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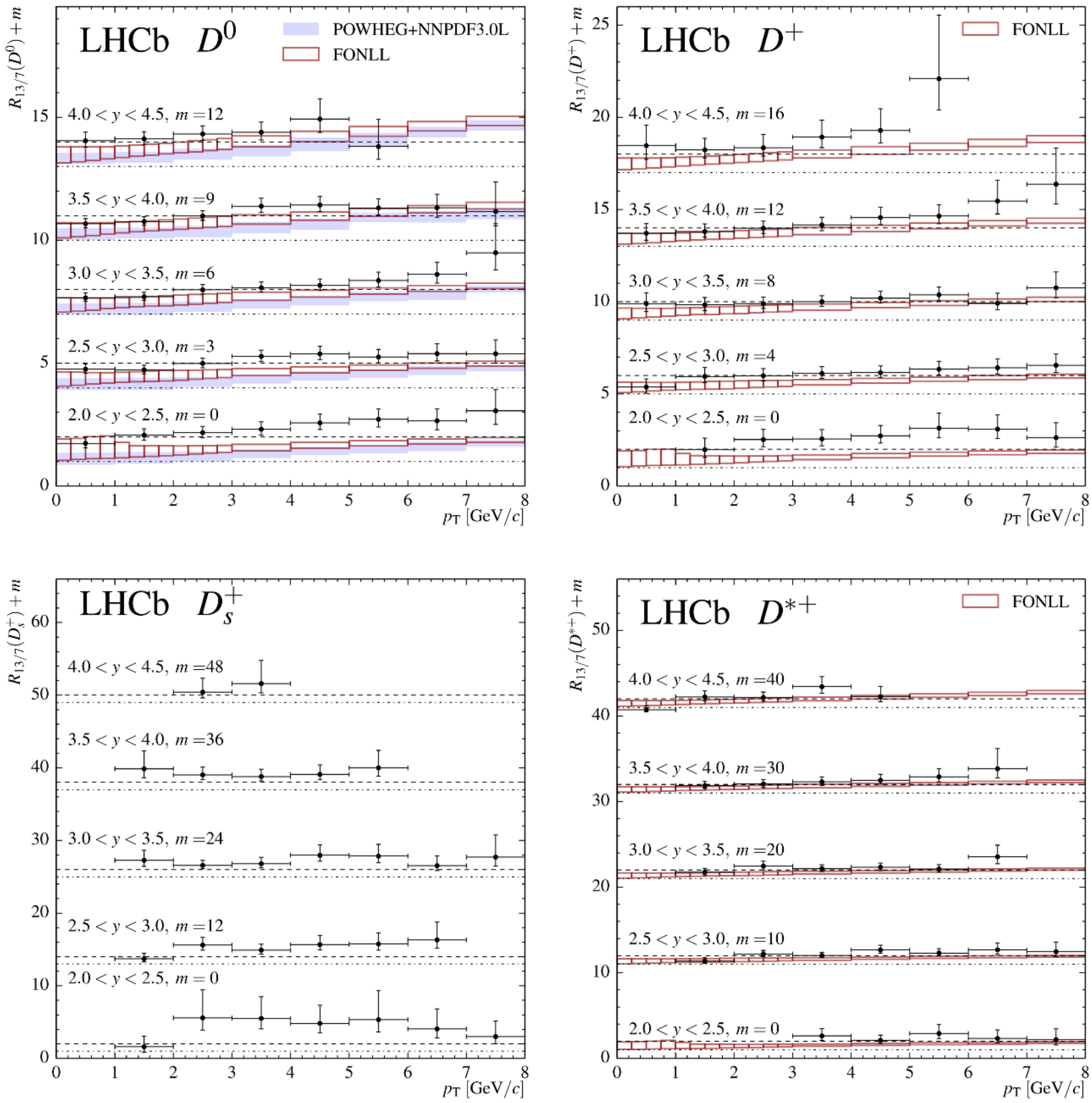

Figure 7. Measurements and predictions of the prompt D^0, D^+, D_s^+, and D^{*+} cross-section ratios. The dash-dotted lines indicate the unit ratio for each of the rapidity intervals and the dashed lines indicate a ratio of two. Each set of measurements and predictions in a given rapidity bin is offset by an additive constant m, which is shown on the plot. No prediction is available for the D_s^+ ratio.

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			Extrapolation factor	Cross-section (µb)
D^0	$0 < p_T < 8$ GeV/c	$2 < y < 4.5$	1.0004 ± 0.0009	$3240 \pm 4 \pm 190$
D^+	$0 < p_T < 8$ GeV/c	$2 < y < 4.5$	—	$1290 \pm 8 \pm 190$
D^0	$1 < p_T < 8$ GeV/c	$2 < y < 4.5$	1.0005 ± 0.0009	$2470 \pm 3 \pm 130$
D^+	$1 < p_T < 8$ GeV/c	$2 < y < 4.5$	—	$1000 \pm 3 \pm 110$
D_s^+	$1 < p_T < 8$ GeV/c	$2 < y < 4.5$	—	$460 \pm 13 \pm 100$
D^{*+}	$1 < p_T < 8$ GeV/c	$2 < y < 4.5$	1.0004 ± 0.0023	$880 \pm 5 \pm 140$

Table 3. Prompt charm production cross-sections in the kinematic ranges given. The computation of the extrapolation factors is described in the text. The first uncertainty on the cross-section is statistical, and the second is systematic and includes the contribution from the extrapolation factor. No extrapolation factor is given for $D_{(s)}^+$ as a measurement is available in every bin of the integrated phase space.

Quantity	Measurement
$\sigma(D^+ \to K^-\pi^+\pi^+)/\sigma(D^0 \to K^-\pi^+)$	$0.953^{+0.003-0.060}_{-0.003-0.054}$
$\sigma(D_s^+ \to [K^-K^+]_\phi\pi^+)/\sigma(D^0 \to K^-\pi^+)$	$0.106^{+0.003-0.009}_{-0.003-0.010}$
$\sigma(D^{*+} \to [K^-\pi^+]_{D^0}\pi^+)/\sigma(D^0 \to K^-\pi^+)$	$0.242^{+0.001-0.027}_{-0.001-0.026}$
$\sigma(D_s^+ \to [K^-K^+]_\phi\pi^+)/\sigma(D^+ \to K^-\pi^+\pi^+)$	$0.112^{+0.004+0.006}_{-0.004-0.009}$
$\sigma(D^{*+} \to [K^-\pi^+]_{D^0}\pi^+)/\sigma(D^+ \to K^-\pi^+\pi^+)$	$0.254^{+0.001+0.016}_{-0.001-0.017}$
$\sigma(D_s^+ \to [K^-K^+]_\phi\pi^+)/\sigma(D^{*+} \to [K^-\pi^+]_{D^0}\pi^+)$	$0.444^{+0.013+0.042}_{-0.013-0.052}$

Table 4. Ratios of integrated cross-section-times-branching-fraction measurements in the kinematic range $1 < p_T < 8$ GeV/c and $2 < y < 4.5$. The first uncertainty on the ratio is statistical and the second is systematic. The notation $\sigma(D \to f)$ is shorthand for $\sigma(D) \times \mathcal{B}(D \to f)$.

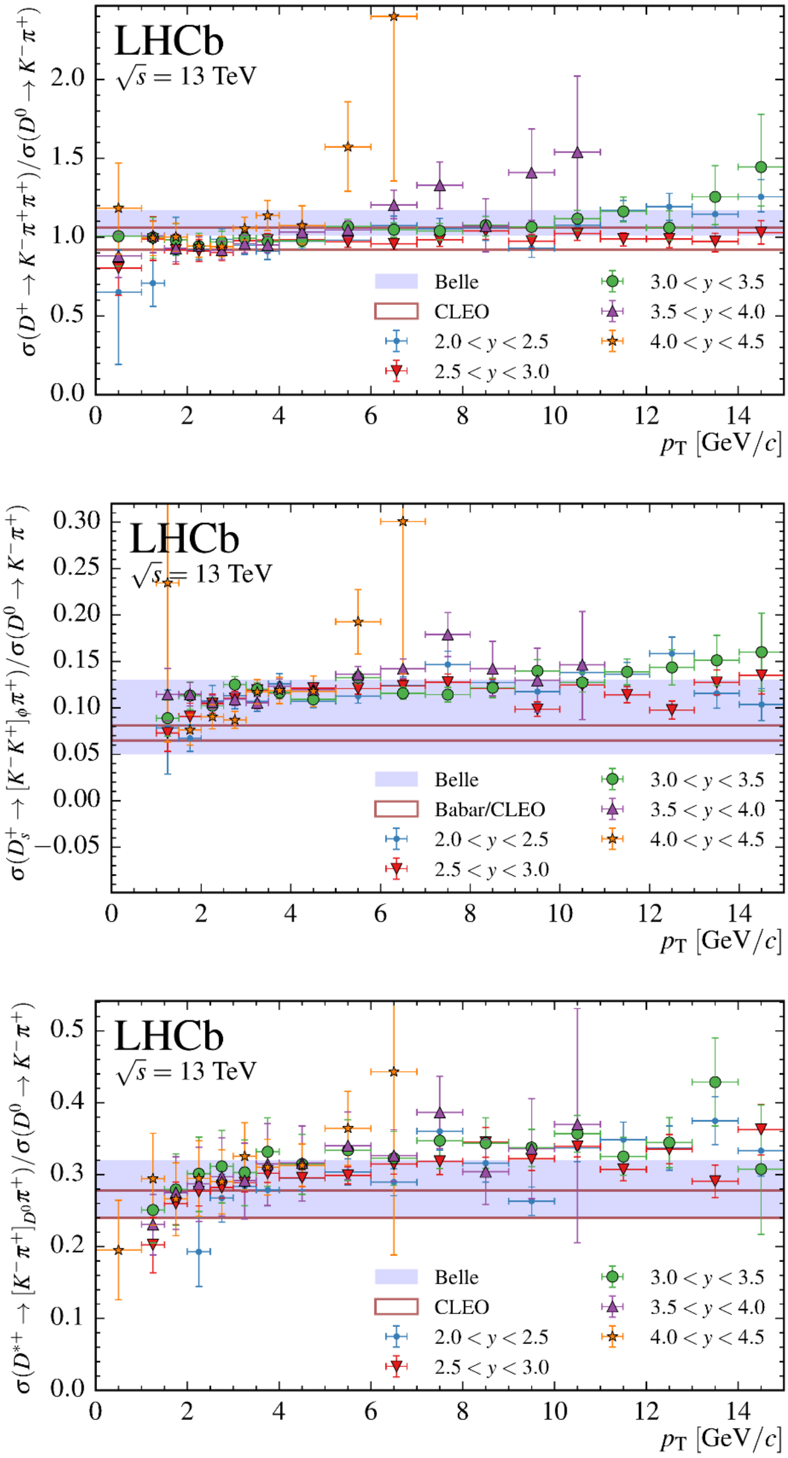

Figure 8. Ratios of cross-section-times-branching-fraction measurements of (top) D^+, (middle) D_s^+, and (bottom) D^{*+} mesons with respect to the D^0 measurements. The bands indicate the corresponding ratios computed using measurements from e^+e^- collider experiments [39–41]. The ratios are given as a function of p_{T} and different symbols indicate different ranges in y. The notation $\sigma(D \to f)$ is shorthand for $\sigma(D) \times \mathcal{B}(D \to f)$.

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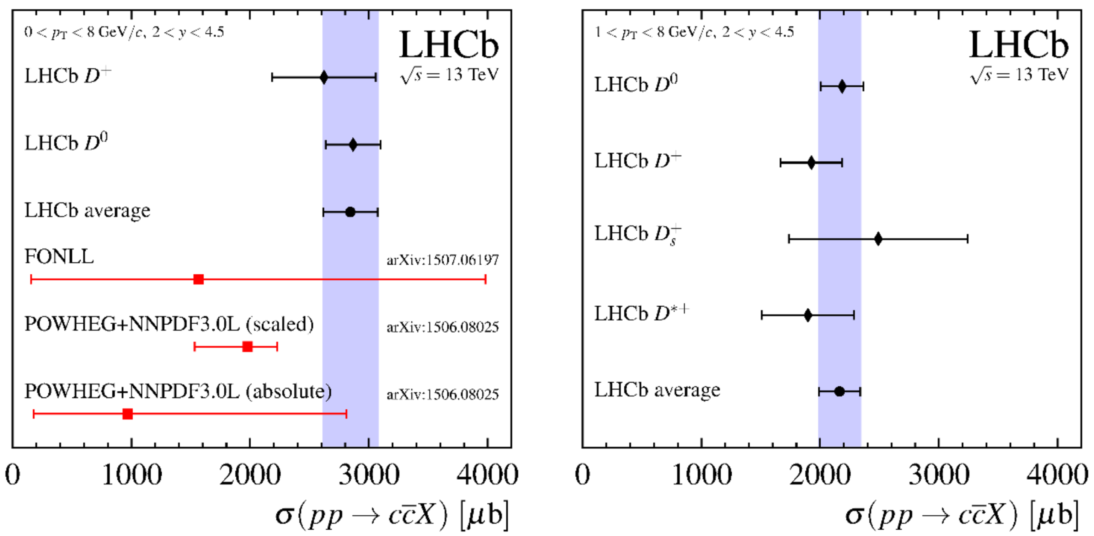

Figure 9. Integrated cross-sections (black diamonds), their average (black circle and blue band) and theory predictions (red squares) [1, 2] are shown (left) based on the D^0 and D^+ for $0 < p_T < 8$ GeV/c and (right) for measurements based on all four mesons for $1 < p_T < 8$ GeV/c. The "absolute" predictions are based on calculations of the 13 TeV cross-section, while the "scaled" predictions are based on calculations of the 13 to 7 TeV ratio multiplied with the LHCb measurement at 7 TeV [16].

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p_{T} [MeV/c]	y [2, 2.5]	[2.5, 3]	[3, 3.5]	[3.5, 4]	[4, 4.5]
[0, 1000]	$395\,^{+3}_{-3}\,^{+33}_{-27}$	$339\,^{+1}_{-1}\,^{+24}_{-20}$	$301.2\,^{+0.9}_{-0.9}\,^{+20.1}_{-16.2}$	$269\,^{+1}_{-1}\,^{+18}_{-16}$	$235\,^{+2}_{-2}\,^{+19}_{-16}$
[1000, 1500]	$635\,^{+4}_{-4}\,^{+54}_{-44}$	$537\,^{+2}_{-2}\,^{+39}_{-33}$	$477\,^{+2}_{-2}\,^{+31}_{-28}$	$422\,^{+2}_{-2}\,^{+30}_{-24}$	$363\,^{+3}_{-3}\,^{+27}_{-25}$
[1500, 2000]	$584\,^{+3}_{-3}\,^{+46}_{-42}$	$475\,^{+2}_{-2}\,^{+33}_{-29}$	$404\,^{+1}_{-1}\,^{+25}_{-23}$	$371\,^{+1}_{-1}\,^{+25}_{-20}$	$329\,^{+3}_{-3}\,^{+25}_{-22}$
[2000, 2500]	$434\,^{+2}_{-2}\,^{+30}_{-32}$	$378\,^{+1}_{-1}\,^{+25}_{-22}$	$323.2\,^{+1.0}_{-1.0}\,^{+19.2}_{-18.5}$	$271\,^{+1}_{-1}\,^{+18}_{-14}$	$219\,^{+2}_{-2}\,^{+15}_{-13}$
[2500, 3000]	$314\,^{+2}_{-2}\,^{+25}_{-18}$	$274.8\,^{+0.9}_{-0.9}\,^{+17.3}_{-15.4}$	$219.9\,^{+0.7}_{-0.7}\,^{+13.0}_{-11.9}$	$190.7\,^{+0.8}_{-0.8}\,^{+12.3}_{-11.0}$	$152\,^{+1}_{-1}\,^{+10}_{-10}$
[3000, 3500]	$229\,^{+1}_{-1}\,^{+16}_{-14}$	$188.1\,^{+0.6}_{-0.6}\,^{+11.3}_{-10.3}$	$153.6\,^{+0.5}_{-0.5}\,^{+9.2}_{-8.1}$	$129.2\,^{+0.6}_{-0.6}\,^{+8.8}_{-7.9}$	$90.7\,^{+1.0}_{-1.0}\,^{+7.0}_{-6.5}$
[3500, 4000]	$157.6\,^{+0.9}_{-0.9}\,^{+10.6}_{-9.5}$	$129.5\,^{+0.5}_{-0.5}\,^{+7.7}_{-6.9}$	$105.5\,^{+0.4}_{-0.4}\,^{+6.6}_{-5.3}$	$87.1\,^{+0.5}_{-0.5}\,^{+5.8}_{-5.2}$	$57.5\,^{+0.8}_{-0.8}\,^{+6.0}_{-5.3}$
[4000, 5000]	$95.6\,^{+0.4}_{-0.4}\,^{+6.5}_{-5.1}$	$76.7\,^{+0.2}_{-0.2}\,^{+4.5}_{-4.0}$	$62.1\,^{+0.2}_{-0.2}\,^{+3.9}_{-3.1}$	$48.1\,^{+0.2}_{-0.2}\,^{+2.9}_{-2.6}$	$33.3\,^{+0.5}_{-0.5}\,^{+4.7}_{-3.9}$
[5000, 6000]	$50.8\,^{+0.3}_{-0.3}\,^{+3.3}_{-3.0}$	$39.8\,^{+0.2}_{-0.2}\,^{+2.4}_{-2.0}$	$29.4\,^{+0.1}_{-0.1}\,^{+1.7}_{-1.7}$	$22.6\,^{+0.2}_{-0.2}\,^{+1.4}_{-1.3}$	$11.7\,^{+0.5}_{-0.5}\,^{+2.7}_{-1.9}$
[6000, 7000]	$26.1\,^{+0.2}_{-0.2}\,^{+1.7}_{-1.5}$	$20.6\,^{+0.1}_{-0.1}\,^{+1.2}_{-1.1}$	$15.62\,^{+0.10}_{-0.10}\,^{+0.98}_{-0.86}$	$10.82\,^{+0.12}_{-0.12}\,^{+0.91}_{-0.83}$	$3.4\,^{+0.5}_{-0.5}\,^{+2.4}_{-1.2}$
[7000, 8000]	$14.3\,^{+0.1}_{-0.1}\,^{+1.0}_{-0.9}$	$11.50\,^{+0.08}_{-0.08}\,^{+0.70}_{-0.64}$	$8.72\,^{+0.07}_{-0.07}\,^{+0.58}_{-0.46}$	$4.95\,^{+0.10}_{-0.10}\,^{+0.71}_{-0.57}$	
[8000, 9000]	$9.58\,^{+0.11}_{-0.11}\,^{+0.78}_{-0.66}$	$6.53\,^{+0.06}_{-0.06}\,^{+0.43}_{-0.37}$	$5.00\,^{+0.06}_{-0.06}\,^{+0.36}_{-0.27}$	$3.25\,^{+0.12}_{-0.12}\,^{+0.65}_{-0.49}$	
[9000, 10000]	$5.80\,^{+0.08}_{-0.08}\,^{+0.40}_{-0.33}$	$4.22\,^{+0.05}_{-0.05}\,^{+0.26}_{-0.19}$	$3.05\,^{+0.05}_{-0.05}\,^{+0.19}_{-0.14}$	$1.70\,^{+0.13}_{-0.13}\,^{+0.55}_{-0.32}$	
[10000, 11000]	$3.75\,^{+0.07}_{-0.07}\,^{+0.28}_{-0.24}$	$2.65\,^{+0.04}_{-0.04}\,^{+0.18}_{-0.11}$	$1.84\,^{+0.04}_{-0.04}\,^{+0.15}_{-0.10}$	$0.78\,^{+0.14}_{-0.14}\,^{+0.34}_{-0.17}$	
[11000, 12000]	$2.26\,^{+0.05}_{-0.05}\,^{+0.19}_{-0.15}$	$1.82\,^{+0.04}_{-0.04}\,^{+0.13}_{-0.07}$	$1.185\,^{+0.039}_{-0.039}\,^{+0.098}_{-0.066}$		
[12000, 13000]	$1.54\,^{+0.04}_{-0.04}\,^{+0.17}_{-0.13}$	$1.277\,^{+0.032}_{-0.032}\,^{+0.100}_{-0.046}$	$0.814\,^{+0.039}_{-0.039}\,^{+0.076}_{-0.051}$		
[13000, 14000]	$1.12\,^{+0.04}_{-0.04}\,^{+0.13}_{-0.09}$	$0.897\,^{+0.029}_{-0.029}\,^{+0.085}_{-0.025}$	$0.504\,^{+0.035}_{-0.035}\,^{+0.088}_{-0.049}$		
[14000, 15000]	$0.748\,^{+0.033}_{-0.033}\,^{+0.086}_{-0.050}$	$0.597\,^{+0.024}_{-0.024}\,^{+0.060}_{-0.026}$	$0.297\,^{+0.034}_{-0.034}\,^{+0.062}_{-0.033}$		

Table 5. Differential production cross-sections, $\mathrm{d}^2\sigma/(\mathrm{d}p_{\mathrm{T}}\,\mathrm{d}y)$, in μb/(GeV/c) for prompt $D^0 + \overline{D}^0$ mesons in bins of (p_{T}, y). The first uncertainty is statistical, and the second is the total systematic.

$p_{\rm T}$ [MeV/c]	y [2, 2.5]	[2.5, 3]	[3, 3.5]	[3.5, 4]	[4, 4.5]
[0, 1000]	$1.74^{+0.09}_{-0.08}{}^{+0.23}_{-0.17}$	$1.76^{+0.07}_{-0.06}{}^{+0.20}_{-0.15}$	$1.66^{+0.07}_{-0.06}{}^{+0.18}_{-0.13}$	$1.67^{+0.09}_{-0.08}{}^{+0.18}_{-0.14}$	$2.05^{+0.21}_{-0.17}{}^{+0.28}_{-0.19}$
[1000, 2000]	$2.07^{+0.08}_{-0.08}{}^{+0.24}_{-0.19}$	$1.73^{+0.05}_{-0.05}{}^{+0.19}_{-0.15}$	$1.70^{+0.05}_{-0.05}{}^{+0.18}_{-0.14}$	$1.76^{+0.07}_{-0.07}{}^{+0.19}_{-0.14}$	$2.12^{+0.15}_{-0.13}{}^{+0.26}_{-0.19}$
[2000, 3000]	$2.18^{+0.08}_{-0.08}{}^{+0.23}_{-0.19}$	$1.99^{+0.05}_{-0.05}{}^{+0.21}_{-0.17}$	$1.98^{+0.06}_{-0.05}{}^{+0.20}_{-0.17}$	$1.98^{+0.07}_{-0.07}{}^{+0.21}_{-0.16}$	$2.32^{+0.16}_{-0.14}{}^{+0.29}_{-0.22}$
[3000, 4000]	$2.31^{+0.10}_{-0.09}{}^{+0.28}_{-0.22}$	$2.28^{+0.08}_{-0.07}{}^{+0.24}_{-0.19}$	$2.07^{+0.07}_{-0.07}{}^{+0.22}_{-0.17}$	$2.39^{+0.11}_{-0.10}{}^{+0.30}_{-0.23}$	$2.39^{+0.22}_{-0.18}{}^{+0.35}_{-0.25}$
[4000, 5000]	$2.57^{+0.14}_{-0.13}{}^{+0.33}_{-0.23}$	$2.38^{+0.10}_{-0.09}{}^{+0.29}_{-0.21}$	$2.16^{+0.10}_{-0.10}{}^{+0.24}_{-0.17}$	$2.43^{+0.16}_{-0.14}{}^{+0.31}_{-0.23}$	$2.93^{+0.53}_{-0.39}{}^{+0.63}_{-0.38}$
[5000, 6000]	$2.72^{+0.21}_{-0.18}{}^{+0.36}_{-0.26}$	$2.25^{+0.13}_{-0.12}{}^{+0.29}_{-0.21}$	$2.36^{+0.17}_{-0.15}{}^{+0.30}_{-0.23}$	$2.31^{+0.22}_{-0.19}{}^{+0.30}_{-0.23}$	$1.81^{+0.80}_{-0.42}{}^{+0.77}_{-0.30}$
[6000, 7000]	$2.65^{+0.31}_{-0.25}{}^{+0.39}_{-0.26}$	$2.39^{+0.23}_{-0.19}{}^{+0.33}_{-0.23}$	$2.61^{+0.32}_{-0.26}{}^{+0.37}_{-0.24}$	$2.32^{+0.39}_{-0.30}{}^{+0.37}_{-0.25}$	
[7000, 8000]	$3.06^{+0.66}_{-0.47}{}^{+0.54}_{-0.29}$	$2.38^{+0.42}_{-0.31}{}^{+0.38}_{-0.23}$	$3.49^{+0.96}_{-0.62}{}^{+0.68}_{-0.31}$	$2.17^{+0.95}_{-0.51}{}^{+0.72}_{-0.28}$	

Table 9. The ratios of differential production cross-sections, $R_{13/7}$, for prompt $D^0+\overline{D}^0$ mesons in bins of $(p_{\rm T}, y)$. The first uncertainty is statistical, and the second is the total systematic.

p_T [MeV/c]	y [2, 2.5]	[2.5, 3]	[3, 3.5]	[3.5, 4]	[4, 4.5]
[0, 1000]	$65^{+6}_{-6}{}^{+26}_{-46}$	$80^{+3}_{-3}{}^{+17}_{-17}$	$101^{+3}_{-2}{}^{+19}_{-19}$	$88^{+3}_{-3}{}^{+14}_{-13}$	$118^{+8}_{-8}{}^{+28}_{-28}$
[1000, 1500]	$71^{+3}_{-3}{}^{+14}_{-14}$	$99^{+1}_{-1}{}^{+14}_{-13}$	$99.8^{+0.8}_{-0.8}{}^{+12.6}_{-13.1}$	$101^{+1}_{-1}{}^{+10}_{-11}$	$99^{+2}_{-2}{}^{+10}_{-11}$
[1500, 2000]	$100^{+2}_{-2}{}^{+12}_{-11}$	$92.0^{+0.6}_{-0.6}{}^{+9.9}_{-9.0}$	$98.3^{+0.6}_{-0.5}{}^{+10.2}_{-10.1}$	$92.9^{+0.6}_{-0.6}{}^{+6.4}_{-8.4}$	$100.1^{+1.5}_{-1.5}{}^{+8.7}_{-9.0}$
[2000, 2500]	$92.0^{+1.1}_{-1.1}{}^{+8.3}_{-6.2}$	$91.3^{+0.5}_{-0.5}{}^{+7.2}_{-6.8}$	$94.3^{+0.4}_{-0.4}{}^{+8.2}_{-7.2}$	$94.4^{+0.6}_{-0.6}{}^{+5.7}_{-7.2}$	$94.4^{+1.2}_{-1.1}{}^{+6.6}_{-7.0}$
[2500, 3000]	$98.6^{+1.0}_{-1.0}{}^{+6.6}_{-6.7}$	$90.3^{+0.4}_{-0.4}{}^{+5.3}_{-5.3}$	$97.0^{+0.4}_{-0.4}{}^{+6.8}_{-6.3}$	$91.7^{+0.5}_{-0.6}{}^{+5.6}_{-5.8}$	$93.9^{+1.2}_{-1.2}{}^{+6.3}_{-6.2}$
[3000, 3500]	$94.9^{+0.9}_{-0.9}{}^{+5.8}_{-5.8}$	$97.8^{+0.5}_{-0.5}{}^{+5.0}_{-4.7}$	$99.3^{+0.5}_{-0.5}{}^{+5.8}_{-5.8}$	$95.9^{+0.6}_{-0.6}{}^{+5.3}_{-5.8}$	$105.5^{+1.5}_{-1.4}{}^{+6.9}_{-7.1}$
[3500, 4000]	$91.0^{+0.9}_{-0.9}{}^{+5.1}_{-5.2}$	$98.1^{+0.5}_{-0.5}{}^{+4.1}_{-4.5}$	$97.2^{+0.5}_{-0.5}{}^{+4.0}_{-5.8}$	$95.1^{+0.7}_{-0.7}{}^{+5.3}_{-4.7}$	$113.8^{+1.9}_{-1.9}{}^{+9.3}_{-9.4}$
[4000, 5000]	$97.3^{+0.7}_{-0.7}{}^{+4.6}_{-4.6}$	$98.3^{+0.5}_{-0.4}{}^{+3.7}_{-3.5}$	$97.8^{+0.5}_{-0.4}{}^{+4.6}_{-4.1}$	$103.3^{+0.7}_{-0.7}{}^{+5.3}_{-4.0}$	$107^{+2}_{-2}{}^{+12}_{-11}$
[5000, 6000]	$98.1^{+0.9}_{-0.9}{}^{+5.3}_{-4.3}$	$97.1^{+0.6}_{-0.6}{}^{+3.7}_{-3.5}$	$106.8^{+0.7}_{-0.7}{}^{+4.6}_{-4.5}$	$104.6^{+1.0}_{-1.0}{}^{+5.5}_{-4.5}$	$157^{+7}_{-6}{}^{+28}_{-27}$
[6000, 7000]	$107.3^{+1.2}_{-1.2}{}^{+5.9}_{-5.6}$	$95.7^{+0.7}_{-0.7}{}^{+4.1}_{-3.6}$	$104.7^{+0.9}_{-0.9}{}^{+4.3}_{-4.7}$	$120.4^{+1.7}_{-1.7}{}^{+9.3}_{-8.5}$	$240^{+40}_{-30}{}^{+140}_{-100}$
[7000, 8000]	$105.3^{+1.4}_{-1.4}{}^{+6.4}_{-6.1}$	$98.3^{+1.0}_{-1.0}{}^{+4.9}_{-4.0}$	$103.9^{+1.2}_{-1.2}{}^{+4.6}_{-5.5}$	$133^{+3}_{-3}{}^{+14}_{-15}$	
[8000, 9000]	$105.8^{+1.8}_{-1.7}{}^{+7.1}_{-7.8}$	$104.0^{+1.4}_{-1.3}{}^{+5.6}_{-5.2}$	$107.5^{+1.6}_{-1.6}{}^{+5.2}_{-6.6}$	$107^{+5}_{-4}{}^{+17}_{-16}$	
[9000, 10000]	$93.0^{+1.9}_{-1.8}{}^{+4.7}_{-5.6}$	$97.4^{+1.7}_{-1.6}{}^{+3.9}_{-4.4}$	$106.5^{+2.2}_{-2.1}{}^{+3.6}_{-5.7}$	$141^{+12}_{-11}{}^{+25}_{-28}$	
[10000, 11000]	$107.6^{+2.7}_{-2.7}{}^{+4.0}_{-4.9}$	$102.2^{+2.2}_{-2.1}{}^{+2.9}_{-3.7}$	$111.7^{+3.2}_{-3.1}{}^{+4.3}_{-6.9}$	$154^{+33}_{-24}{}^{+35}_{-35}$	
[11000, 12000]	$117.0^{+3.6}_{-3.5}{}^{+5.1}_{-5.7}$	$98.8^{+2.6}_{-2.5}{}^{+2.8}_{-3.7}$	$116.3^{+4.8}_{-4.3}{}^{+7.9}_{-5.0}$		
[12000, 13000]	$119.2^{+4.6}_{-4.5}{}^{+7.2}_{-7.4}$	$98.8^{+3.3}_{-3.1}{}^{+2.6}_{-4.6}$	$106.0^{+6.0}_{-5.7}{}^{+9.0}_{-5.3}$		
[13000, 14000]	$114.6^{+5.3}_{-5.0}{}^{+7.3}_{-6.8}$	$97.3^{+4.0}_{-3.9}{}^{+3.2}_{-5.4}$	$126^{+10}_{-9}{}^{+17}_{-15}$		
[14000, 15000]	$125.5^{+7.3}_{-6.7}{}^{+8.2}_{-6.7}$	$102.8^{+5.3}_{-5.0}{}^{+5.5}_{-5.1}$	$144^{+20}_{-16}{}^{+27}_{-19}$		

Table 13. The ratios of differential production cross-section-times-branching fraction measurements for prompt D^+ and D^0 mesons in bins of (p_T, y). The first uncertainty is statistical, and the second is the total systematic. All values are given in percent.

p_T [MeV/c]	y [2, 2.5]	[2.5, 3]	[3, 3.5]	[3.5, 4]	[4, 4.5]
[1000, 1500]	$7.8^{+1.9}_{-1.9}{}^{+3.6}_{-4.6}$	$7.3^{+0.5}_{-0.5}{}^{+1.9}_{-1.9}$	$8.9^{+0.5}_{-0.5}{}^{+1.9}_{-1.9}$	$11.4^{+1.1}_{-1.1}{}^{+2.6}_{-2.6}$	$23^{+8}_{-8}{}^{+7}_{-15}$
[1500, 2000]	$6.7^{+0.4}_{-0.4}{}^{+1.4}_{-1.3}$	$9.1^{+0.2}_{-0.2}{}^{+1.4}_{-1.4}$	$11.3^{+0.3}_{-0.3}{}^{+1.4}_{-1.5}$	$11.5^{+0.4}_{-0.4}{}^{+1.2}_{-1.2}$	$7.6^{+0.8}_{-0.8}{}^{+1.4}_{-1.4}$
[2000, 2500]	$10.7^{+0.4}_{-0.4}{}^{+1.7}_{-1.6}$	$10.4^{+0.2}_{-0.2}{}^{+1.0}_{-1.0}$	$10.22^{+0.17}_{-0.17}{}^{+0.88}_{-0.90}$	$10.61^{+0.25}_{-0.25}{}^{+0.70}_{-0.70}$	$9.0^{+0.6}_{-0.6}{}^{+1.1}_{-1.2}$
[2500, 3000]	$11.3^{+0.3}_{-0.3}{}^{+1.4}_{-1.4}$	$11.01^{+0.16}_{-0.16}{}^{+0.73}_{-0.73}$	$12.51^{+0.18}_{-0.18}{}^{+0.85}_{-0.88}$	$10.94^{+0.22}_{-0.22}{}^{+0.66}_{-0.67}$	$8.69^{+0.44}_{-0.43}{}^{+0.81}_{-0.80}$
[3000, 3500]	$10.7^{+0.3}_{-0.3}{}^{+1.0}_{-1.0}$	$11.89^{+0.17}_{-0.18}{}^{+0.65}_{-0.64}$	$12.01^{+0.18}_{-0.18}{}^{+0.69}_{-0.70}$	$10.56^{+0.21}_{-0.21}{}^{+0.62}_{-0.62}$	$11.7^{+0.6}_{-0.6}{}^{+1.2}_{-1.2}$
[3500, 4000]	$12.6^{+0.3}_{-0.3}{}^{+1.0}_{-1.0}$	$11.58^{+0.18}_{-0.18}{}^{+0.57}_{-0.58}$	$11.65^{+0.19}_{-0.19}{}^{+0.60}_{-0.60}$	$12.33^{+0.27}_{-0.27}{}^{+0.73}_{-0.72}$	$11.9^{+0.7}_{-0.7}{}^{+1.3}_{-1.3}$
[4000, 5000]	$10.72^{+0.22}_{-0.21}{}^{+0.67}_{-0.67}$	$12.11^{+0.15}_{-0.15}{}^{+0.51}_{-0.51}$	$10.91^{+0.15}_{-0.15}{}^{+0.42}_{-0.43}$	$11.97^{+0.22}_{-0.22}{}^{+0.53}_{-0.51}$	$11.8^{+0.6}_{-0.5}{}^{+1.6}_{-1.6}$
[5000, 6000]	$11.25^{+0.25}_{-0.25}{}^{+0.73}_{-0.71}$	$12.07^{+0.20}_{-0.19}{}^{+0.58}_{-0.58}$	$13.25^{+0.23}_{-0.23}{}^{+0.60}_{-0.60}$	$13.62^{+0.31}_{-0.31}{}^{+0.78}_{-0.78}$	$19.3^{+1.5}_{-1.4}{}^{+3.1}_{-3.2}$
[6000, 7000]	$12.39^{+0.34}_{-0.34}{}^{+0.89}_{-0.91}$	$12.36^{+0.26}_{-0.25}{}^{+0.66}_{-0.66}$	$11.57^{+0.27}_{-0.26}{}^{+0.59}_{-0.58}$	$14.21^{+0.48}_{-0.47}{}^{+0.94}_{-0.94}$	$30^{+6}_{-5}{}^{+15}_{-16}$
[7000, 8000]	$14.7^{+0.5}_{-0.5}{}^{+1.3}_{-1.3}$	$12.76^{+0.34}_{-0.34}{}^{+0.82}_{-0.82}$	$11.42^{+0.34}_{-0.33}{}^{+0.71}_{-0.72}$	$17.9^{+0.9}_{-0.9}{}^{+2.2}_{-2.2}$	
[8000, 9000]	$12.7^{+0.5}_{-0.5}{}^{+1.4}_{-1.3}$	$12.09^{+0.41}_{-0.41}{}^{+0.90}_{-0.90}$	$12.16^{+0.46}_{-0.45}{}^{+0.93}_{-0.95}$	$14.2^{+1.1}_{-1.0}{}^{+2.7}_{-2.7}$	
[9000, 10000]	$11.7^{+0.6}_{-0.6}{}^{+1.2}_{-1.2}$	$9.85^{+0.42}_{-0.42}{}^{+0.66}_{-0.64}$	$14.0^{+0.7}_{-0.7}{}^{+1.0}_{-1.0}$	$13.0^{+1.6}_{-1.5}{}^{+3.0}_{-3.1}$	
[10000, 11000]	$13.80^{+0.86}_{-0.84}{}^{+0.64}_{-0.68}$	$12.46^{+0.66}_{-0.66}{}^{+0.39}_{-0.37}$	$12.73^{+0.85}_{-0.85}{}^{+0.58}_{-0.58}$	$14.6^{+4.2}_{-3.2}{}^{+4.0}_{-4.9}$	
[11000, 12000]	$13.6^{+1.1}_{-1.1}{}^{+0.7}_{-0.7}$	$11.41^{+0.75}_{-0.75}{}^{+0.45}_{-0.43}$	$13.9^{+1.2}_{-1.1}{}^{+0.7}_{-0.8}$		
[12000, 13000]	$15.8^{+1.4}_{-1.4}{}^{+1.1}_{-1.1}$	$9.76^{+0.86}_{-0.85}{}^{+0.44}_{-0.46}$	$14.4^{+1.6}_{-1.5}{}^{+1.0}_{-1.2}$		
[13000, 14000]	$11.6^{+1.4}_{-1.3}{}^{+0.8}_{-0.9}$	$12.7^{+1.2}_{-1.1}{}^{+0.6}_{-0.7}$	$15.1^{+2.4}_{-2.2}{}^{+1.3}_{-1.6}$		
[14000, 15000]	$10.4^{+1.6}_{-1.5}{}^{+0.7}_{-0.8}$	$13.5^{+1.6}_{-1.6}{}^{+1.1}_{-1.2}$	$16.0^{+3.7}_{-3.2}{}^{+2.0}_{-2.6}$		

Table 14. The ratios of differential production cross-section-times-branching-fraction measurements for prompt D_s^+ and D^0 mesons in bins of (p_T, y). The first uncertainty is statistical, and the second is the total systematic. All values are given in percent.

p_{T} [MeV/c]	y [2, 2.5]	[2.5, 3]	[3, 3.5]	[3.5, 4]	[4, 4.5]
[0, 1000]					$19.5\,^{+2.7}_{-2.7}\,^{+6.4}_{-6.4}$
[1000, 1500]		$20.2\,^{+0.8}_{-0.8}\,^{+3.7}_{-3.8}$	$25.1\,^{+0.3}_{-0.3}\,^{+4.5}_{-4.6}$	$23.1\,^{+0.4}_{-0.4}\,^{+4.1}_{-4.2}$	$29.4\,^{+0.9}_{-1.0}\,^{+6.2}_{-6.4}$
[1500, 2000]		$26.0\,^{+0.4}_{-0.4}\,^{+2.9}_{-2.9}$	$27.9\,^{+0.2}_{-0.2}\,^{+4.9}_{-5.0}$	$27.5\,^{+0.3}_{-0.3}\,^{+5.0}_{-5.1}$	$26.6\,^{+0.6}_{-0.6}\,^{+5.0}_{-5.1}$
[2000, 2500]	$19.3\,^{+1.8}_{-1.8}\,^{+4.5}_{-4.5}$	$27.7\,^{+0.3}_{-0.3}\,^{+2.0}_{-2.0}$	$30.1\,^{+0.2}_{-0.2}\,^{+5.1}_{-5.3}$	$28.7\,^{+0.3}_{-0.3}\,^{+5.1}_{-5.2}$	$29.5\,^{+0.6}_{-0.6}\,^{+5.2}_{-5.3}$
[2500, 3000]	$26.7\,^{+0.9}_{-0.9}\,^{+3.2}_{-3.2}$	$28.2\,^{+0.3}_{-0.3}\,^{+1.5}_{-1.4}$	$31.1\,^{+0.2}_{-0.2}\,^{+5.0}_{-5.1}$	$29.7\,^{+0.3}_{-0.3}\,^{+5.4}_{-5.5}$	$29.0\,^{+0.6}_{-0.6}\,^{+4.4}_{-4.4}$
[3000, 3500]	$28.4\,^{+0.7}_{-0.7}\,^{+2.6}_{-2.6}$	$28.9\,^{+0.3}_{-0.3}\,^{+1.3}_{-1.3}$	$30.3\,^{+0.2}_{-0.2}\,^{+4.5}_{-4.6}$	$29.2\,^{+0.3}_{-0.3}\,^{+5.2}_{-5.3}$	$32.6\,^{+0.8}_{-0.8}\,^{+4.6}_{-4.6}$
[3500, 4000]	$27.9\,^{+0.6}_{-0.6}\,^{+2.2}_{-2.1}$	$30.2\,^{+0.3}_{-0.3}\,^{+1.3}_{-1.3}$	$33.2\,^{+0.3}_{-0.3}\,^{+4.7}_{-4.8}$	$31.5\,^{+0.4}_{-0.3}\,^{+5.6}_{-5.8}$	$31.0\,^{+0.9}_{-0.9}\,^{+3.8}_{-3.8}$
[4000, 5000]	$29.5\,^{+0.4}_{-0.4}\,^{+1.6}_{-1.6}$	$29.6\,^{+0.2}_{-0.2}\,^{+1.1}_{-1.1}$	$31.5\,^{+0.2}_{-0.2}\,^{+4.1}_{-4.2}$	$31.6\,^{+0.3}_{-0.3}\,^{+5.1}_{-5.3}$	$31.3\,^{+1.0}_{-1.0}\,^{+2.8}_{-2.8}$
[5000, 6000]	$30.4\,^{+0.5}_{-0.5}\,^{+1.8}_{-1.8}$	$29.9\,^{+0.3}_{-0.3}\,^{+1.2}_{-1.2}$	$33.4\,^{+0.3}_{-0.3}\,^{+4.2}_{-4.2}$	$34.0\,^{+0.5}_{-0.5}\,^{+4.7}_{-4.7}$	$36.4\,^{+2.5}_{-2.3}\,^{+4.5}_{-4.6}$
[6000, 7000]	$29.0\,^{+0.5}_{-0.5}\,^{+1.8}_{-1.8}$	$31.5\,^{+0.3}_{-0.3}\,^{+1.3}_{-1.4}$	$32.3\,^{+0.4}_{-0.4}\,^{+3.7}_{-3.7}$	$32.6\,^{+0.7}_{-0.7}\,^{+3.5}_{-3.5}$	$44\,^{+11}_{-9}\,^{+21}_{-24}$
[7000, 8000]	$36.0\,^{+0.7}_{-0.7}\,^{+2.5}_{-2.5}$	$31.8\,^{+0.4}_{-0.4}\,^{+1.8}_{-1.8}$	$34.7\,^{+0.5}_{-0.5}\,^{+3.8}_{-3.8}$	$38.6\,^{+1.3}_{-1.3}\,^{+4.9}_{-4.9}$	
[8000, 9000]	$31.6\,^{+0.8}_{-0.8}\,^{+2.5}_{-2.5}$	$34.5\,^{+0.6}_{-0.6}\,^{+2.0}_{-2.0}$	$34.4\,^{+0.7}_{-0.7}\,^{+3.4}_{-3.5}$	$30.4\,^{+1.9}_{-1.8}\,^{+4.0}_{-4.2}$	
[9000, 10000]	$26.3\,^{+0.8}_{-0.8}\,^{+1.8}_{-1.8}$	$32.2\,^{+0.7}_{-0.7}\,^{+1.5}_{-1.5}$	$33.8\,^{+0.9}_{-0.9}\,^{+2.4}_{-2.5}$	$33.6\,^{+4.0}_{-3.6}\,^{+5.7}_{-5.9}$	
[10000, 11000]	$33.7\,^{+1.2}_{-1.2}\,^{+1.5}_{-1.5}$	$33.9\,^{+1.0}_{-1.0}\,^{+1.1}_{-1.1}$	$35.7\,^{+1.4}_{-1.3}\,^{+2.1}_{-2.2}$	$37\,^{+11}_{-8}\,^{+12}_{-14}$	
[11000, 12000]	$34.9\,^{+1.5}_{-1.5}\,^{+1.9}_{-1.8}$	$30.7\,^{+1.1}_{-1.1}\,^{+1.2}_{-1.2}$	$32.5\,^{+1.8}_{-1.7}\,^{+1.9}_{-1.9}$		
[12000, 13000]	$33.7\,^{+1.9}_{-1.8}\,^{+2.4}_{-2.5}$	$33.5\,^{+1.5}_{-1.4}\,^{+1.4}_{-1.4}$	$34.5\,^{+2.7}_{-2.5}\,^{+2.2}_{-2.4}$		
[13000, 14000]	$37.5\,^{+2.4}_{-2.3}\,^{+2.4}_{-2.4}$	$29.1\,^{+1.7}_{-1.7}\,^{+1.4}_{-1.5}$	$42.9\,^{+4.9}_{-4.5}\,^{+3.7}_{-4.1}$		
[14000, 15000]	$33.3\,^{+2.8}_{-2.7}\,^{+2.2}_{-2.3}$	$36.3\,^{+2.6}_{-2.4}\,^{+2.3}_{-2.6}$	$30.8\,^{+6.2}_{-5.4}\,^{+6.5}_{-7.3}$		

Table 15. The ratios of differential production cross-section-times-branching-fraction measurements for prompt D^{*+} and D^0 mesons in bins of (p_{T}, y). The first uncertainty is statistical, and the second is the total systematic. All values are given in percent.

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