

## "Erratum: Measurement of $D^\pm$ production in deep inelastic scattering at HERA"

The ZEUS collaboration ; Piotrkowski, Krzysztof

### Abstract

Erratum to: JHEP05(2013)097

Document type : *Article de périodique (Journal article)*

## Référence bibliographique

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The ZEUS collaboration ; Piotrkowski, Krzysztof. *Erratum: Measurement of  $D^\pm$  production in deep inelastic scattering at HERA*. In: *Journal of High Energy Physics*, Vol. 2014, no.2, p. 106 [1-9 (2014)]

DOI : 10.1007/JHEP02(2014)106

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# Erratum: Measurement of $D^{*\pm}$ production in deep inelastic scattering at HERA

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## The ZEUS collaboration

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ERRATUM TO: [JHEP05\(2013\)097](#)

ARXIV EPRINT: [1303.6578](#)

In the analysis for our paper on  $D^*$  production, the beauty contribution was erroneously subtracted twice in the extraction of the reduced cross sections. This affected tables 9 and 10 as well as figures 9 and 10 that are reproduced here in a corrected version. The kinematical acceptances shown in the last column of table 10 have been also corrected since they were calculated with a different value for the charm fragmentation fraction than what was used in the rest of the analysis and reported in the text. A misprint was found in table 7: the value in the third column at four rows from the bottom should read 49.8, not 59.8. Finally, one of the authors was missing from the author list: C. Uribe-Estrada (Department of Physics, University of Oxford, United Kingdom).

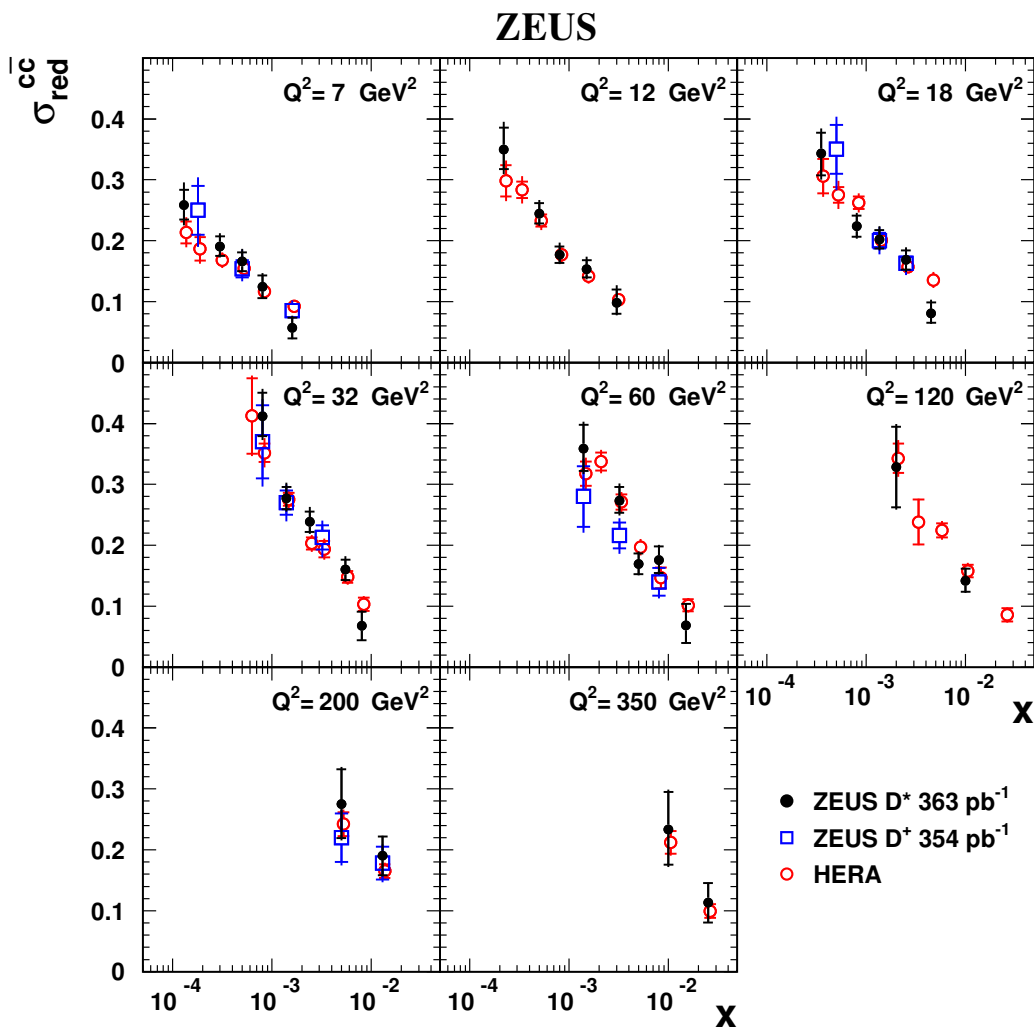
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$Q^2$ (GeV <sup>2</sup> )	$x$	$\delta_{m_c}$ (%)	$\delta_\mu$ (%)	$\delta_{\alpha_s}$ (%)	$\delta_{\alpha_K}$ (%)	$\delta_{k_T}$ (%)	$\delta_b$ (%)
7	0.00160	+8.3 -5.6	-6.5 +14	+0.6 +0.2	-4.5 +7.5	-0.2 +0.6	$\pm 0.0$
	0.00080	+0.3 +1.0	-3.9 +7.8	-0.3 +0.6	-3.5 +6.1	-1.3 +1.3	$\pm 0.3$
	0.00050	-1.3 +2.0	-3.2 +5.0	+0.1 +0.8	-2.9 +6.5	-1.3 +1.8	$\pm 0.6$
	0.00030	-3.2 +3.3	-1.4 +0.2	-0.9 +1.2	-2.6 +5.9	-2.5 +2.2	$\pm 1.0$
	0.00013	-3.7 +5.7	+4.7 -6.3	-1.6 +2.5	-2.4 +5.9	-4.0 +4.2	$\pm 2.1$
12	0.00300	+9.5 -6.2	-6.5 +15	+1.4 +0.0	-3.6 +8.0	+1.6 +0.1	$\pm 0.0$
	0.00150	+0.1 -1.1	-5.4 +7.8	-0.1 -0.6	-3.3 +5.3	-0.7 -0.1	$\pm 0.3$
	0.00080	-0.6 +0.8	-3.8 +5.7	-0.1 +0.1	-2.5 +5.5	-0.9 +1.0	$\pm 0.7$
	0.00050	-2.5 +2.2	-2.5 +2.0	-0.5 +0.0	-2.4 +5.0	-1.9 +1.2	$\pm 1.2$
	0.00022	-3.2 +3.9	+3.1 -4.4	-1.6 +1.7	-2.2 +5.4	-3.1 +1.8	$\pm 2.1$
18	0.00450	+8.8 -6.1	-6.5 +13	+0.9 +0.7	-3.2 +6.2	+1.1 -1.0	$\pm 0.1$
	0.00250	+0.3 -0.9	-5.7 +7.0	+0.4 -0.6	-3.2 +3.7	-0.3 -0.6	$\pm 0.4$
	0.00135	-0.4 +0.8	-4.4 +6.1	+0.6 +0.1	-2.4 +4.8	-0.5 +0.6	$\pm 0.8$
	0.00080	-1.5 +1.0	-4.0 +3.2	+0.3 +0.3	-1.9 +4.4	-0.9 +0.7	$\pm 1.7$
	0.00035	-3.0 +2.7	+1.8 -3.7	-1.0 +1.0	-2.5 +4.5	-2.9 +1.4	$\pm 2.9$
32	0.00800	+8.4 -7.3	-7.0 +11	+0.6 -0.5	-3.5 +5.1	+0.3 -1.7	$\pm 0.1$
	0.00550	+1.3 -0.0	-5.8 +8.4	+0.5 -0.3	-1.9 +3.2	+0.3 -0.3	$\pm 0.3$
	0.00240	+0.5 +0.5	-3.6 +6.4	-0.1 +0.3	-1.7 +3.9	-0.2 +0.0	$\pm 0.9$
	0.00140	-0.5 +1.3	-3.5 +4.6	+0.2 +0.1	-1.6 +3.9	-0.4 +0.6	$\pm 1.9$
	0.00080	-2.9 +3.0	-0.4 -1.6	-0.8 +0.5	-2.2 +3.6	-2.2 +1.1	$\pm 2.7$
60	0.01500	+9.3 -6.5	-5.2 +10	+0.6 +0.4	-1.8 +6.2	+1.6 +0.4	$\pm 0.0$
	0.00800	+0.6 -1.7	-4.8 +6.0	-0.3 -0.7	-1.9 +2.3	-0.1 -0.6	$\pm 0.9$
	0.00500	-0.2 +0.8	-3.9 +5.2	+0.1 -0.0	-1.4 +2.7	-0.3 +0.3	$\pm 2.3$
	0.00320	-0.9 +1.4	-3.7 +5.0	-0.1 -0.2	-1.6 +2.8	-0.4 +0.0	$\pm 2.7$
	0.00140	-2.4 +1.8	-1.5 +1.3	-0.1 -0.0	-1.8 +2.8	-1.3 +0.6	$\pm 4.4$
120	0.01000	+0.2 +0.8	-4.6 +5.3	+0.4 +0.1	-1.5 +2.3	+0.0 +0.3	$\pm 3.9$
	0.00200	-0.8 +1.3	-2.0 +2.3	+0.4 -0.5	-1.3 +1.9	-1.0 +0.8	$\pm 6.3$
200	0.01300	-0.1 -0.1	-3.7 +3.8	+0.4 -0.1	-0.9 +1.4	+0.1 +0.0	$\pm 3.8$
	0.00500	-1.9 +1.3	-3.8 +3.8	-0.3 -0.6	-1.5 +1.2	-0.1 +0.1	$\pm 6.5$
350	0.02500	-0.5 +0.4	-3.8 +3.4	-0.4 -0.0	-0.7 +1.2	+0.4 -0.4	$\pm 4.6$
	0.01000	-0.2 +1.3	-2.8 +3.7	+0.0 +0.3	-0.6 +0.9	+0.0 +0.1	$\pm 8.7$

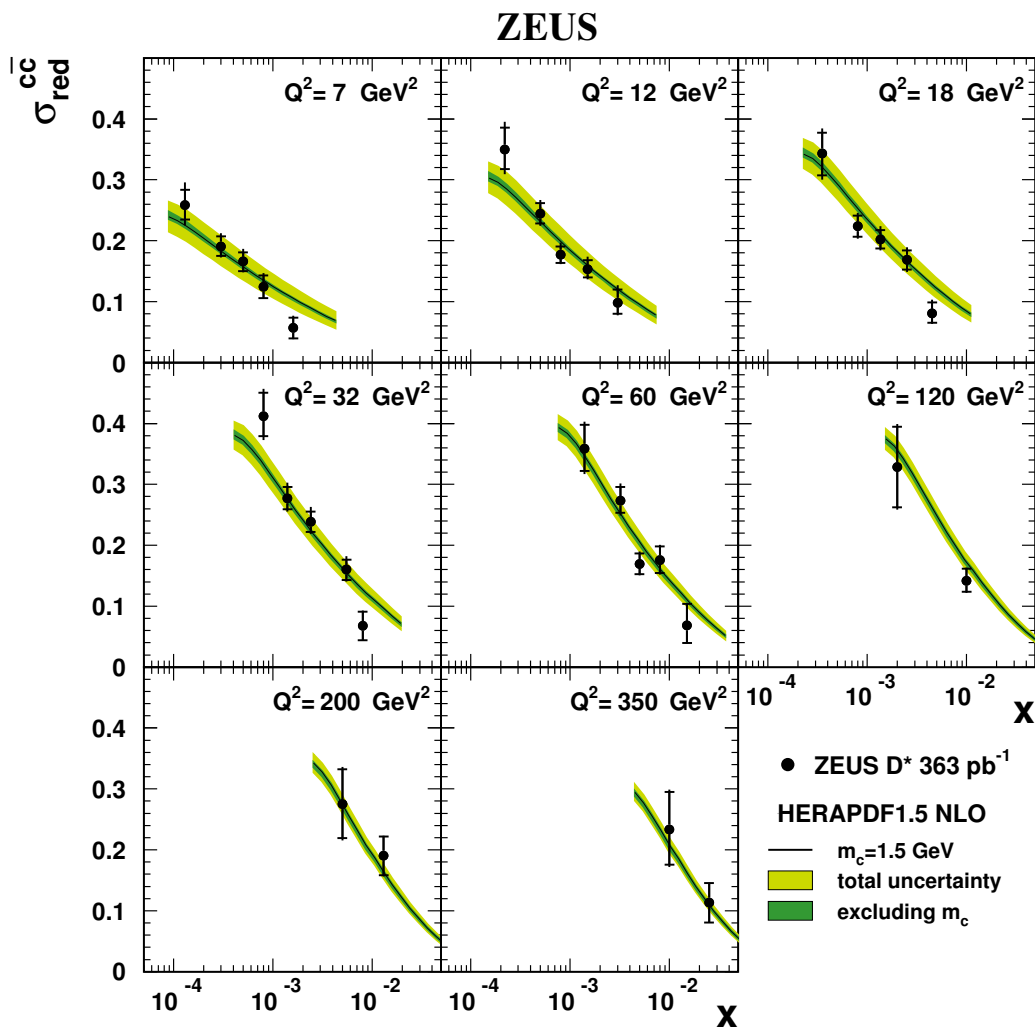
**Table 9.** Breakdown of the theoretical uncertainty on  $\sigma_{\text{red}}^{c\bar{c}}(x, Q^2)$ , showing the uncertainty from the variation of charm mass ( $\delta_{m_c}$ ), of the renormalisation and factorisation scales ( $\delta_\mu$ ), of  $\alpha_S$  ( $\delta_{\alpha_s}$ ), of the fragmentation function ( $\delta_{\alpha_K}$ ), of the transverse fragmentation ( $\delta_{k_T}$ ), and of the expected beauty component ( $\delta_b$ ). The upper (lower) value gives the effect of a positive (negative) variation of the parameter.

$Q^2$ (GeV <sup>2</sup> )	$x$	$\sigma_{\text{red}}^{c\bar{c}}$	$\delta_{\text{stat.}}$ (%)	$\delta_{\text{syst.}}$ (%)	$\delta_{\text{theo.}}$ (%)	$\mathcal{A}_{ps}$ (%)
7	0.00160	0.057	23	+19 -20	+18 -9.7	0.248
	0.00080	0.124	10	+11 -11	+10 -5.4	0.412
	0.00050	0.166	6.1	+6.8 -7.1	+8.7 -4.7	0.480
	0.00030	0.191	5.4	+6.7 -6.0	+7.3 -5.2	0.481
	0.00013	0.258	7.1	+6.6 -5.7	+11 -9.0	0.327
12	0.00300	0.098	14	+17 -12	+19 -9.7	0.280
	0.00150	0.153	6.6	+7.1 -6.0	+9.4 -6.5	0.462
	0.00080	0.177	5.9	+4.7 -4.6	+8.1 -4.7	0.536
	0.00050	0.244	5.2	+4.6 -3.8	+6.0 -4.9	0.538
	0.00022	0.350	7.5	+6.9 -5.2	+8.1 -7.1	0.363
18	0.00450	0.081	15	+16 -12	+17 -9.5	0.286
	0.00250	0.169	6.5	+6.2 -7.2	+8.0 -6.7	0.499
	0.00135	0.202	5.7	+4.7 -4.8	+7.9 -5.1	0.578
	0.00080	0.224	6.1	+5.1 -4.6	+5.9 -5.0	0.595
	0.00035	0.343	7.8	+6.1 -7.1	+6.5 -6.8	0.404
32	0.00800	0.068	29	+18 -18	+15 -11	0.258
	0.00550	0.160	7.0	+7.5 -7.9	+9.1 -6.2	0.523
	0.00240	0.238	5.5	+4.5 -4.4	+7.6 -4.1	0.613
	0.00140	0.277	5.3	+4.3 -3.5	+6.5 -4.4	0.649
	0.00080	0.412	6.4	+6.8 -4.7	+5.6 -5.4	0.470
60	0.01500	0.068	38	+35 -18	+15 -8.6	0.182
	0.00800	0.176	9.7	+8.1 -7.3	+6.6 -5.6	0.508
	0.00500	0.169	8.8	+5.1 -4.9	+6.4 -4.7	0.624
	0.00320	0.273	6.0	+5.6 -4.1	+6.5 -5.0	0.682
	0.00140	0.359	8.2	+7.2 -6.1	+5.7 -5.7	0.564
120	0.01000	0.141	12	+8.2 -4.5	+7.0 -6.2	0.536
	0.00200	0.329	18	+8.5 -8.8	+7.1 -6.9	0.638
200	0.01300	0.191	16	+5.1 -6.8	+5.6 -5.4	0.508
	0.00500	0.275	19	+7.4 -5.5	+7.8 -8.0	0.682
350	0.02500	0.113	27	+8.9 -11	+5.8 -6.0	0.474
	0.01000	0.234	24	+10 -6.0	+9.6 -9.2	0.696

**Table 10.** The reduced cross-section  $\sigma_{\text{red}}^{c\bar{c}}(x, Q^2)$  with statistical, systematic and theoretical uncertainties. The last column shows the kinematical acceptance.



**Figure 9.** Reduced charm cross sections from  $D^{*\pm}$  (filled circles) compared to the ZEUS  $D^+$  measurement [9] (empty squares) and the combination of previous HERA results [5] (empty circles). The outer error bars include experimental and theoretical uncertainties added in quadrature. The inner error bars in the ZEUS  $D^*$  and  $D^+$  measurements show the experimental uncertainties. The inner error bars of the combined HERA data represent the uncorrelated part of the uncertainty.



**Figure 10.** Reduced charm cross sections (filled circles) compared to a GM-VFNS calculation based on HERAPDF1.5 parton densities. The inner error bars show the experimental uncertainties and the outer error bars show the experimental and theoretical uncertainties added in quadrature. The outer bands on the HERAPDF1.5 prediction show the total uncertainty while the inner bands correspond to the sum in quadrature of all uncertainties excluding the charm-mass variation.

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<sup>C</sup> supported by the German Federal Ministry for Education and Research (BMBF), under contract No. 05 H09PDF

<sup>D</sup> supported by the Science and Technology Facilities Council, UK

<sup>E</sup> supported by HIR and UMRG grants from Universiti Malaya, and an ERGS grant from the Malaysian Ministry for Higher Education

<sup>F</sup> supported by the US National Science Foundation. Any opinion, findings and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

<sup>G</sup> supported by the Polish Ministry of Science and Higher Education as a scientific project No. DPN/N188/DESY/2009

<sup>H</sup> supported by the Polish Ministry of Science and Higher Education and its grants for Scientific Research

<sup>I</sup> supported by the German Federal Ministry for Education and Research (BMBF), under contract No. 05h09GUF, and the SFB 676 of the Deutsche Forschungsgemeinschaft (DFG)

<sup>J</sup> supported by the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) and its grants for Scientific Research

<sup>K</sup> supported by the Korean Ministry of Education and Korea Science and Engineering Foundation

<sup>L</sup> supported by FNRS and its associated funds (IISN and FRIA) and by an Inter-University Attraction Poles Programme subsidised by the Belgian Federal Science Policy Office

<sup>M</sup> supported by the Spanish Ministry of Education and Science through funds provided by CICYT

<sup>N</sup> supported by the Natural Sciences and Engineering Research Council of Canada (NSERC)

<sup>O</sup> partially supported by the German Federal Ministry for Education and Research (BMBF)

<sup>P</sup> supported by RF Presidential grant N 3920.2012.2 for the Leading Scientific Schools and by the Russian Ministry of Education and Science through its grant for Scientific Research on High Energy Physics

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