Title

Erratum to: Measurement of the inclusive jet cross-section in proton-proton collisions at s=7 TeV using 4.5 fb−1 of data with the ATLAS detector

Journal

Journal of High Energy Physics, 2015(9)

ISSN

1126-6708

Authors

The ATLAS collaboration
Aad, G
Abbott, B
et al.

Publication Date

2015-09-01

DOI

10.1007/jhep09(2015)141

Published for SISSA by Springer

Received: *August 18, 2015*
Accepted: *August 19, 2015*
Published: *September 21, 2015*

Erratum: Measurement of the inclusive jet cross-section in proton-proton collisions at $\sqrt{s} = 7$ TeV using 4.5 fb^{-1} of data with the ATLAS detector

The ATLAS collaboration

E-mail: atlas.publications@cern.ch

Erratum to: JHEP02(2015)153

Abstract: It was found that the non-perturbative corrections calculated using Pythia with the Perugia 2011 tune did not include the effect of the underlying event. The affected correction factors were recomputed using the Pythia 6.427 generator. These corrections are applied as baseline to the NLO pQCD calculations and thus the central values of the theoretical predictions have changed by a few percent with the new corrections. This has a minor impact on the agreement between the data and the theoretical predictions. Figures 2 and 6 to 13, and all the tables have been updated with the new values. A few sentences in the discussion in sections 5.2 and 9 were altered or removed.

ArXiv ePrint: 1410.8857

Article funded by SCOAP^3.

doi:10.1007/JHEP09(2015)141

JHEP09(2015)141

Contents

JHEP09(2015)141

5 Theoretical predictions

5.2 Non-perturbative corrections to the NLO pQCD calculations

Non-perturbative corrections are applied to the parton-level cross-sections from the NLO pQCD calculations. The corrections are derived using LO MC generators complemented by an LL parton shower. The correction factors are calculated as the bin-by-bin ratio of the MC cross-sections obtained with and without modelling of hadronisation and the underlying event. The NLO pQCD calculations are then multiplied by these factors.

The correction factors are evaluated using several generators and tunes: PYTHIA 6.427 using the AUET2B [1] and Perugia 2011 [2] tunes, HERWIG++ 2.6.3 using the UE-EE-3 [3] tune, and PYTHIA 8.157 using the 4C [4] and AU2 [5] tunes. The CTEQ6L1 PDF set [6] is used except for the calculation with the Perugia 2011 tune, where the CTEQ5L PDF set is used. The baseline correction is taken from PYTHIA with the Perugia 2011 tune. The envelope of all correction factors is considered as a systematic uncertainty.

The correction factors are shown in figure 2 in representative rapidity bins for jets with $R = 0.4$ and $R = 0.6$, as a function of the jet p_{T}. The baseline correction factors for $R = 0.4$ have a very weak dependence on jet p_{T} and are typically 2% or less from unity. On the other hand the corrections for $R = 0.6$ are up to 6% at low p_{T}. These differences between the two jet sizes result from the different interplay of hadronisation and underlying-event effects. In the high-rapidity region, the uncertainties are similar in size to those in the low-rapidity region at low p_{T}, but do not decrease with the jet p_{T} as rapidly as in the low-rapidity region.

9 Results

The double-differential inclusive jet cross-sections are shown in figures 6 and 7 for jets reconstructed using the anti-k_t algorithm with $R = 0.4$ and $R = 0.6$, respectively. The measurement extends over jet transverse momenta from 100 GeV to 2 TeV in the rapidity region $|y| < 3$. The NLO pQCD predictions calculated with NLOJET++ using the

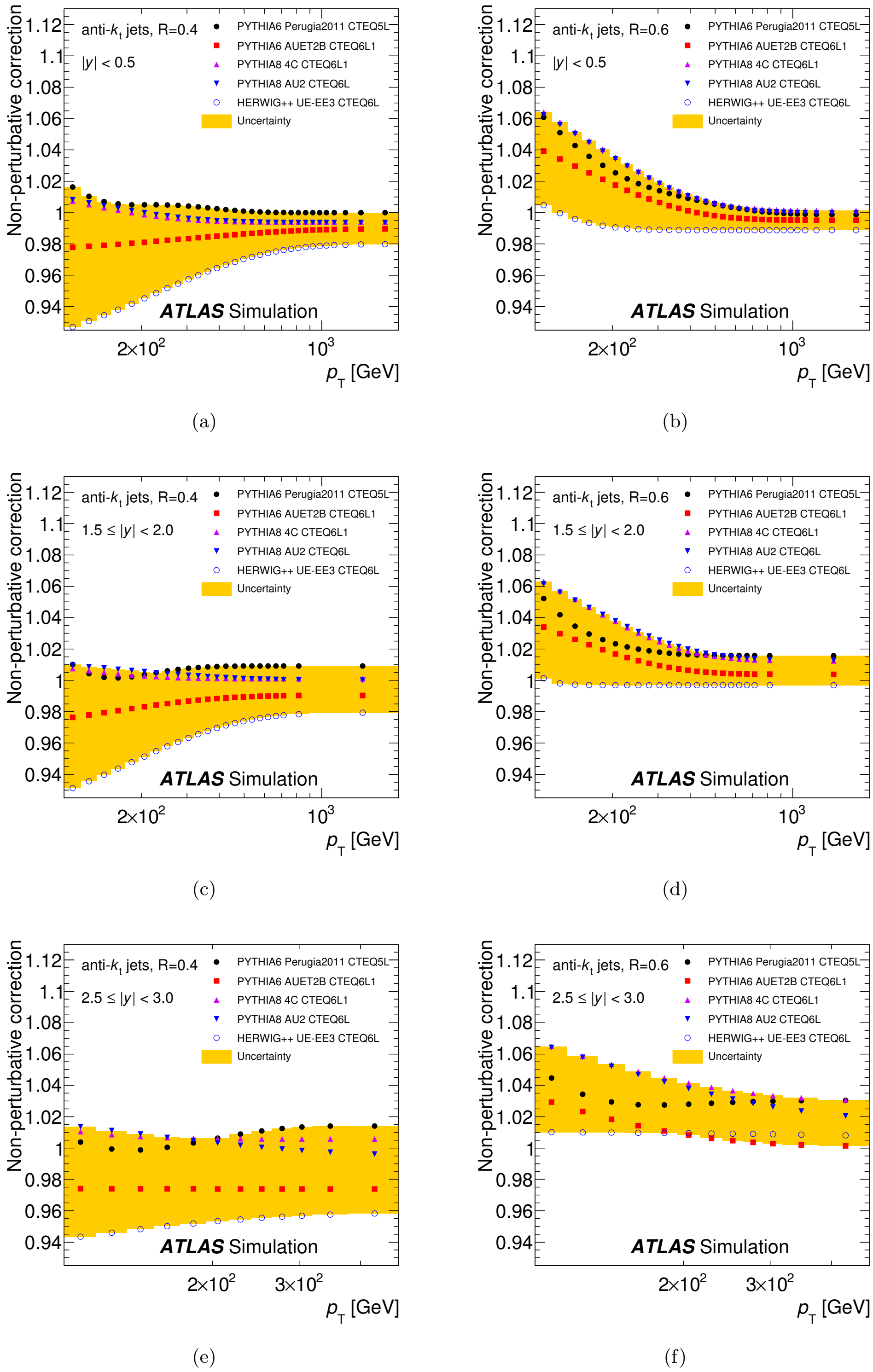

Figure 2. Non-perturbative correction factors applied to fixed order NLO calculations of the inclusive jet cross-section for anti-k_t jets, with (a), (c), (e) $R = 0.4$ and (b), (d), (f) $R = 0.6$ in representative rapidity bins (as indicated in the legends), as a function of the parton-level jet p_T, calculated from MC simulations with various tunes.

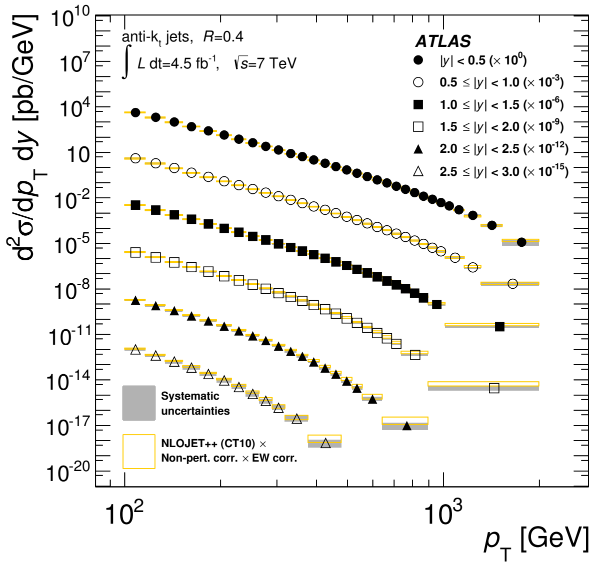

Figure 6. Double-differential inclusive jet cross-sections as a function of the jet p_{T} in bins of rapidity, for anti-k_t jets with $R = 0.4$. For presentation, the cross-sections are multiplied by the factors indicated in the legend. The statistical uncertainties are smaller than the size of the symbols used to plot the cross-section values. The shaded areas indicate the experimental systematic uncertainties. The data are compared to NLO pQCD predictions calculated using NLOJET++ with the CT10 NLO PDF set, to which non-perturbative corrections and electroweak corrections are applied. The open boxes indicate the predictions with their uncertainties. The 1.8% uncertainty from the luminosity measurement is not shown.

CT10 PDF set with corrections for non-perturbative effects and electroweak effects applied are compared to the measurement. The figures show that the NLO pQCD predictions reproduce the measured cross-sections, which range over eight orders of magnitude in the six rapidity bins.

The ratios of the NLO pQCD predictions to the measured cross-sections are presented in figures 8–11. The comparison is shown for the predictions using the NLO PDF sets CT10, MSTW 2008, NNPDF 2.1, HERAPDF1.5 and ABM 11 ($n_{\mathrm{f}} = 5$). The predictions are generally consistent with the measured cross-sections for jets with both radius parameter values, though the level of consistency varies among the predictions with the different PDF sets.

A quantitative comparison of the theoretical predictions to the measurement is performed using a frequentist method. The employed method is fully described in ref. [7] for the ATLAS dijet cross-section measurement. It uses a generalised definition of χ^2 which takes into account the asymmetry of the uncertainties. A large set of pseudo-experiments is generated by fluctuating the theoretical predictions according to the full set of experimental and theoretical uncertainties. The asymmetries and the correlations of these uncertainties are taken into account. The χ^2 value is computed between each pseudo-experimental data set and the theoretical predictions, and a χ^2 distribution is constructed. The observed χ^2

y ranges	P_{obs}					
	NLO PDF set:	CT10	MSTW2008	NNPDF2.1	HERAPDF1.5	ABM11
$\lvert y\rvert < 0.5$		81%	60%	70%	58%	< 0.1%
$0.5 \leq \lvert y\rvert < 1.0$		90%	92%	88%	50%	< 0.1%
$1.0 \leq \lvert y\rvert < 1.5$		87%	87%	84%	92%	3.5%
$1.5 \leq \lvert y\rvert < 2.0$		91%	88%	90%	72%	60%
$2.0 \leq \lvert y\rvert < 2.5$		89%	82%	85%	25%	54%
$2.5 \leq \lvert y\rvert < 3.0$		95%	92%	96%	83%	87%

Table 1. Observed p-values, P_{obs}, evaluated for the NLO pQCD predictions with corrections for non-perturbative and electroweak effects, in comparison to the measured cross-section of anti-k_t jets with $R = 0.4$. The values are given for the predictions using the NLO PDF sets of CT10, MSTW2008, NNPDF2.1, HERAPDF1.5 and ABM11, for each rapidity bin.

value, χ^2_{obs}, is calculated from the measured points and the theoretical prediction. The observed p-value, P_{obs}, which is defined as the fractional area of the χ^2 distribution with $\chi^2 > \chi^2_{\text{obs}}$, is obtained. Tables 1 and 2 show the evaluated values of P_{obs} for the NLO pQCD predictions with non-perturbative and electroweak corrections applied. The predictions generally show agreement with the measured cross-sections, with a few exceptions. The predictions using the ABM11 NLO PDF set fail to describe the measured cross-sections in the low-rapidity region but show good agreement in the high-rapidity region.

The comparisons of the Powheg predictions with the measurement for jets with $R = 0.4$ and $R = 0.6$ are shown in figures 12 and 13, respectively, as a function of the jet p_{T} in bins of the jet rapidity. The NLO pQCD prediction with the CT10 PDF set is also shown. In general, the Powheg predictions are found to be in agreement with the measurement. In the high-rapidity region, the shape of the measured cross-section is very well reproduced by the Powheg predictions, while the predictions tend to be slightly smaller than the measurement for high p_{T} in the low-rapidity region. As seen in previous measurements [8, 9], the Perugia 2011 tune gives a consistently larger prediction than the AUET2B tune.

A Tables of the measured cross-sections

The measured inclusive jet cross-sections are shown in tables 3–8 and 9–14 for jets with $R = 0.4$ and $R = 0.6$, respectively. The correction factors for non-perturbative effects and electroweak effects, which are applied to the NLO pQCD predictions, are also shown in the same table.

The uncertainties due to the JES uncertainty are separated into four categories, *in-situ*, *pile-up*, *close-by* and *flavour*. The *in-situ* category shows the uncertainties from the components of the JES uncertainty given by in-situ calibration techniques. These techniques are based on the transverse momentum balance between a jet and a well-calibrated reference object, such as the balance between a central jet and a forward jet in a dijet

JHEP09(2015)141

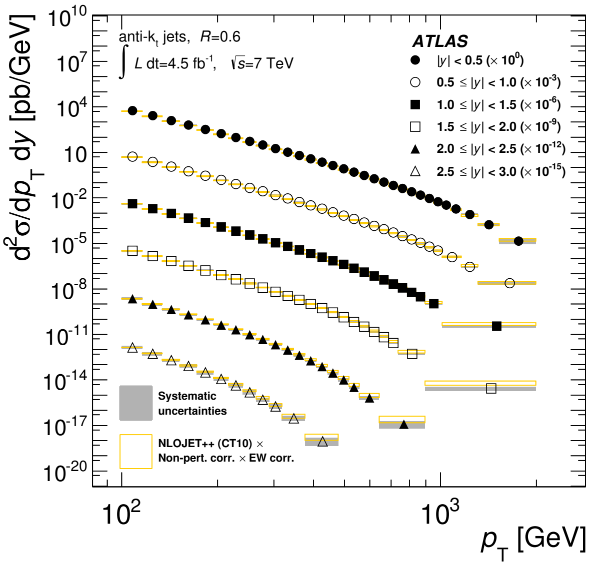

Figure 7. Double-differential inclusive jet cross-sections as a function of the jet p_{T} in bins of rapidity, for anti-k_t jets with $R = 0.6$. For presentation, the cross-sections are multiplied by the factors indicated in the legend. The statistical uncertainties are smaller than the size of the symbols used to plot the cross-section values. The shaded areas indicate the experimental systematic uncertainties. The data are compared to NLO pQCD predictions calculated using NLOJET++ with the CT10 NLO PDF set, to which non-perturbative corrections and electroweak corrections are applied. The open boxes indicate the predictions with their uncertainties. The 1.8% uncertainty from the luminosity measurement is not shown.

y ranges		P_{obs}				
	NLO PDF set:	CT10	MSTW2008	NNPDF2.1	HERAPDF1.5	ABM11
$\lvert y\rvert < 0.5$		60%	52%	65%	29%	< 0.1%
$0.5 \leq \lvert y\rvert < 1.0$		37%	54%	48%	6.0%	< 0.1%
$1.0 \leq \lvert y\rvert < 1.5$		96%	94%	92%	94%	3.3%
$1.5 \leq \lvert y\rvert < 2.0$		90%	84%	86%	93%	56%
$2.0 \leq \lvert y\rvert < 2.5$		87%	86%	89%	49%	74%
$2.5 \leq \lvert y\rvert < 3.0$		92%	99%	98%	80%	80%

Table 2. Observed p-values, P_{obs}, evaluated for the NLO pQCD predictions with corrections for non-perturbative and electroweak effects, in comparison to the measured cross-section of anti-k_t jets with $R = 0.6$. The values are given for the predictions using the NLO PDF sets of CT10, MSTW2008, NNPDF2.1, HERAPDF1.5 and ABM11, for each rapidity bin.

system, the balance between a jet and a Z boson or a photon, and the balance between a recoil system of jets and a photon or a high-p_{T} jet. For jets with $p_{\mathrm{T}} \gtrsim 1$ TeV, where the techniques employing p_{T} balance are limited by sample size, the uncertainty is estimated from a study of the calorimeter response to single hadrons. The *pile-up* category shows

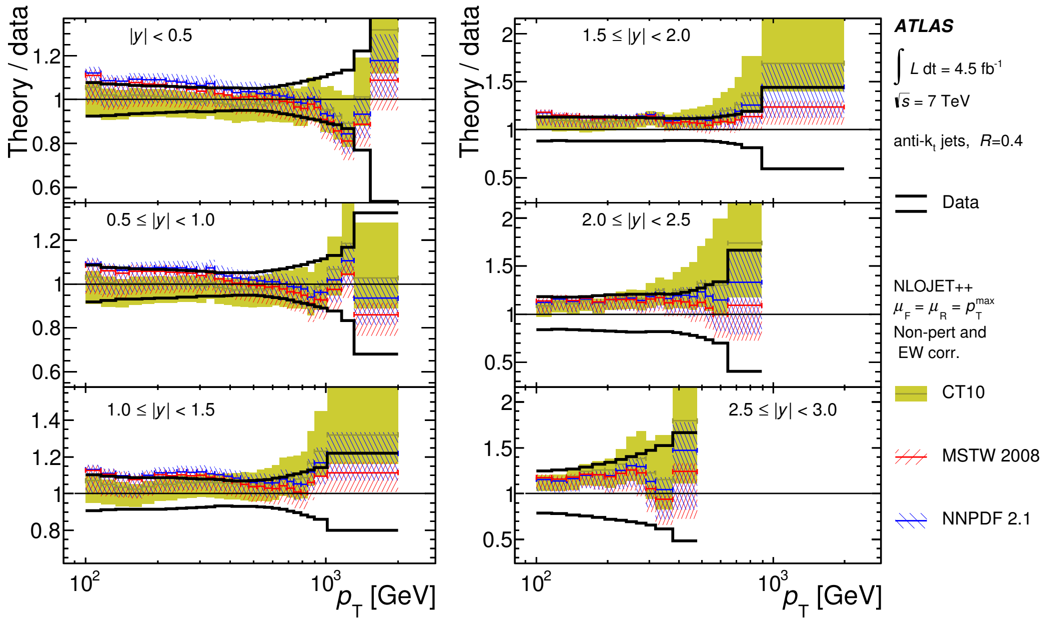

Figure 8. Ratio of NLO pQCD predictions to the measured double-differential inclusive jet cross-section, shown as a function of the jet p_{T} in bins of the jet rapidity, for anti-k_t jets with $R = 0.4$. The predictions are calculated using NLOJET++ with different NLO PDF sets, namely CT10, MSTW2008 and NNPDF 2.1. Non-perturbative corrections and electroweak corrections are applied to the predictions. Their uncertainties are shown by the bands, including all the uncertainties discussed in section 5. The data lines show the total uncertainty except the 1.8% uncertainty from the luminosity measurement.

the uncertainties from the JES due to the subtraction of pile-up energy in the calibration. These uncertainties are evaluated from in-situ studies based on the N_{PV} and $\langle\mu\rangle$ values. The *close-by* category shows the uncertainty from the JES due to the event topology, i.e. the presence of close-by jets. Finally, the *flavour* category shows the uncertainty from the JES due to the assumption of the fraction of jets originating from a quark or a gluon, which are likely to have different fragmentation. Further description can be found in ref. [10]. Due to improvements in the jet calibration technique in 2011, the correlation to the JES uncertainty in 2010 is not available.

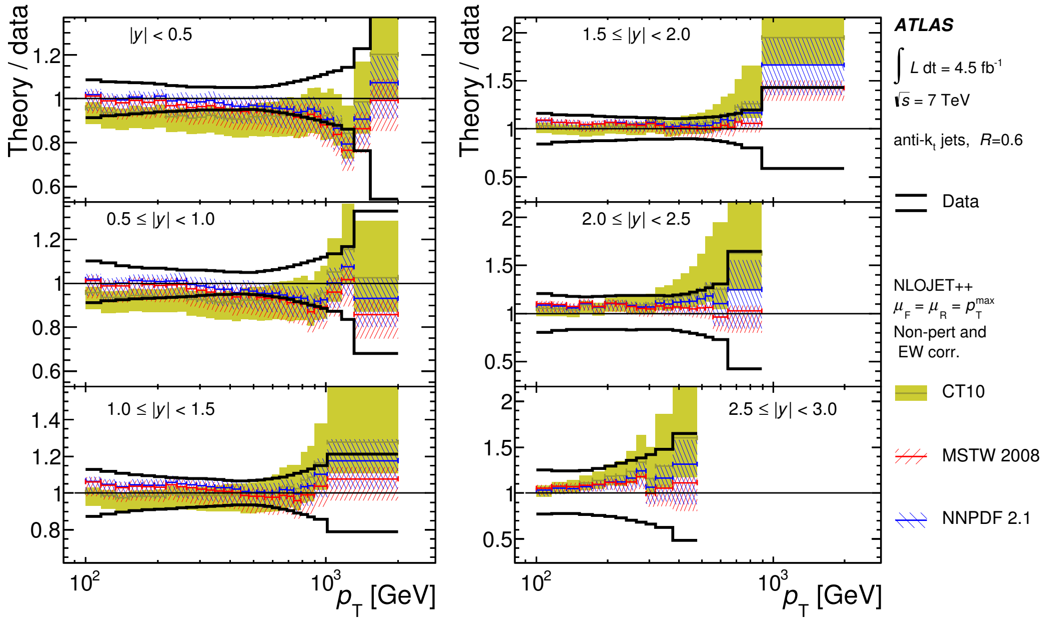

Figure 9. Ratio of NLO pQCD predictions to the measured double-differential inclusive jet cross-section, shown as a function of the jet p_{T} in bins of the jet rapidity, for anti-k_t jets with $R = 0.6$. The predictions are calculated using NLOJET++ with different NLO PDF sets, namely CT10, MSTW2008 and NNPDF 2.1. Non-perturbative corrections and electroweak corrections are applied to the predictions. Their uncertainties are shown by the bands, including all the uncertainties discussed in section 5. The data lines show the total uncertainty except the 1.8% uncertainty from the luminosity measurement.

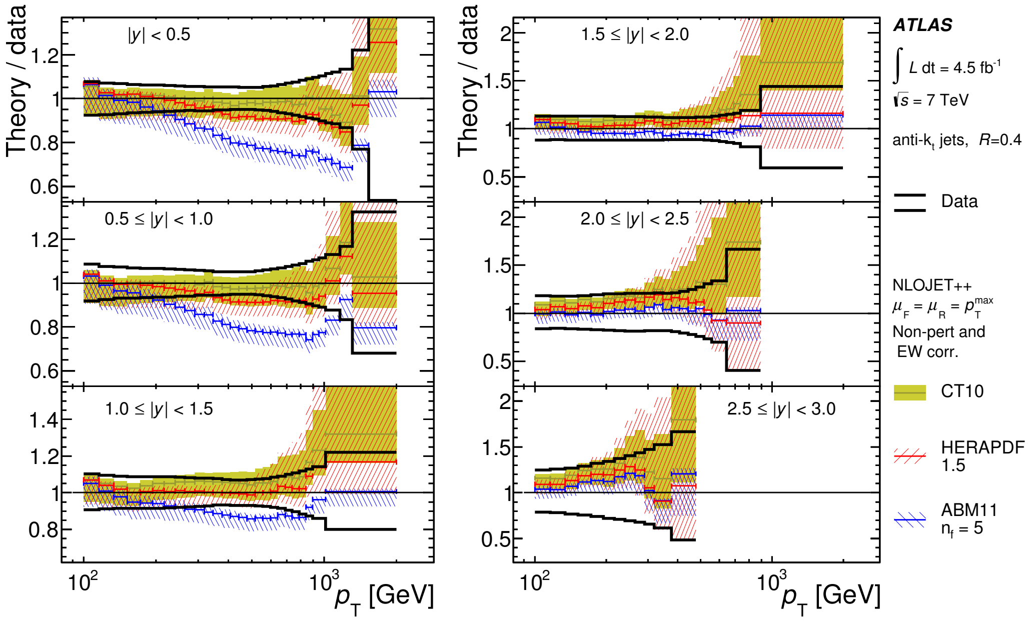

Figure 10. Ratio of NLO pQCD predictions to the measured double-differential inclusive jet cross-section, shown as a function of the jet p_{T} in bins of the jet rapidity, for anti-k_t jets with $R = 0.4$. The predictions are calculated using NLOJET++ with different NLO PDF sets, namely CT10, HERAPDF 1.5 and ABM11. Non-perturbative corrections and electroweak corrections are applied to the predictions. Their uncertainties are shown by the bands, including all the uncertainties discussed in section 5. The data lines show the total uncertainty except the 1.8% uncertainty from the luminosity measurement.

JHEP09(2015)141

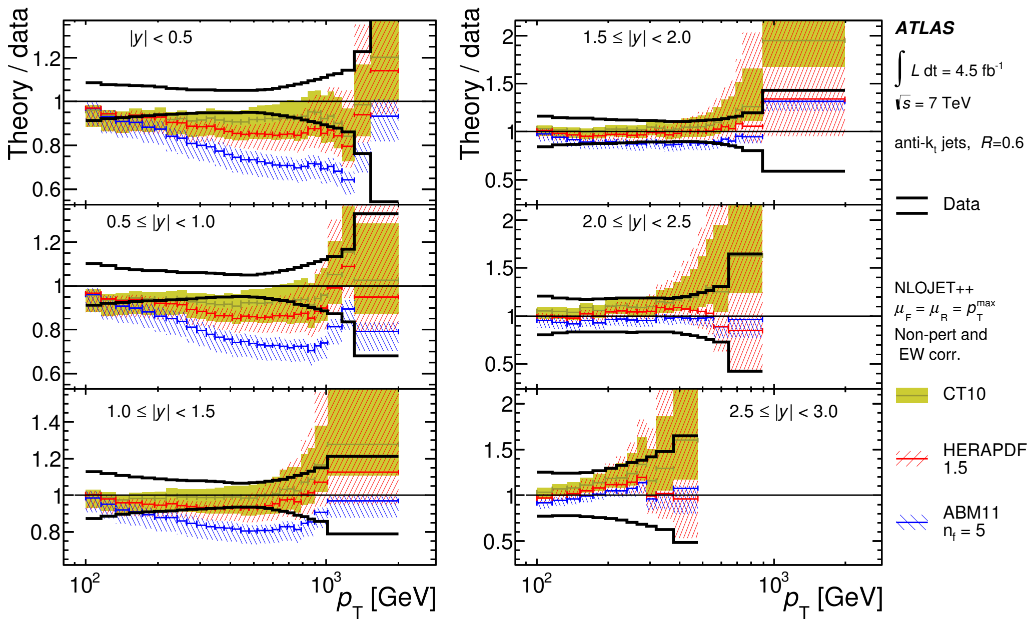

Figure 11. Ratio of NLO pQCD predictions to the measured double-differential inclusive jet cross-section, shown as a function of the jet p_{T} in bins of the jet rapidity, for anti-k_t jets with $R = 0.6$. The predictions are calculated using NLOJET++ with different NLO PDF sets, namely CT10, HERAPDF 1.5 and ABM11. Non-perturbative corrections and electroweak corrections are applied to the predictions. Their uncertainties are shown by the bands, including all the uncertainties discussed in section 5. The data lines show the total uncertainty except the 1.8% uncertainty from the luminosity measurement.

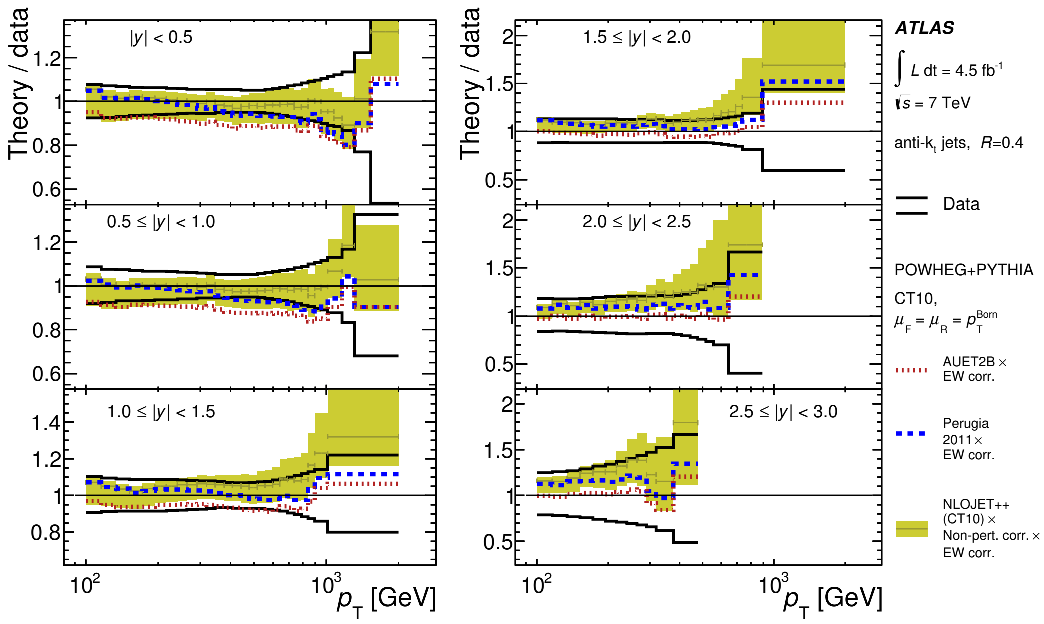

Figure 12. Ratio of predictions from POWHEG to the measured double-differential inclusive jet cross-section, shown as a function of the jet p_{T} in bins of jet rapidity, for anti-k_t jets with $R = 0.4$. The figure also shows the NLO pQCD prediction using NLOJET++ with the CT10 NLO PDF set, corrected for non-perturbative effects and electroweak effects. The POWHEG predictions use PYTHIA for the simulation of parton showers, hadronisation, and the underlying event with the AUET2B tune and the Perugia 2011 tune. Electroweak corrections are applied to the predictions. The data lines show the total uncertainty except the 1.8% uncertainty from the luminosity measurement.

JHEP09(2015)141

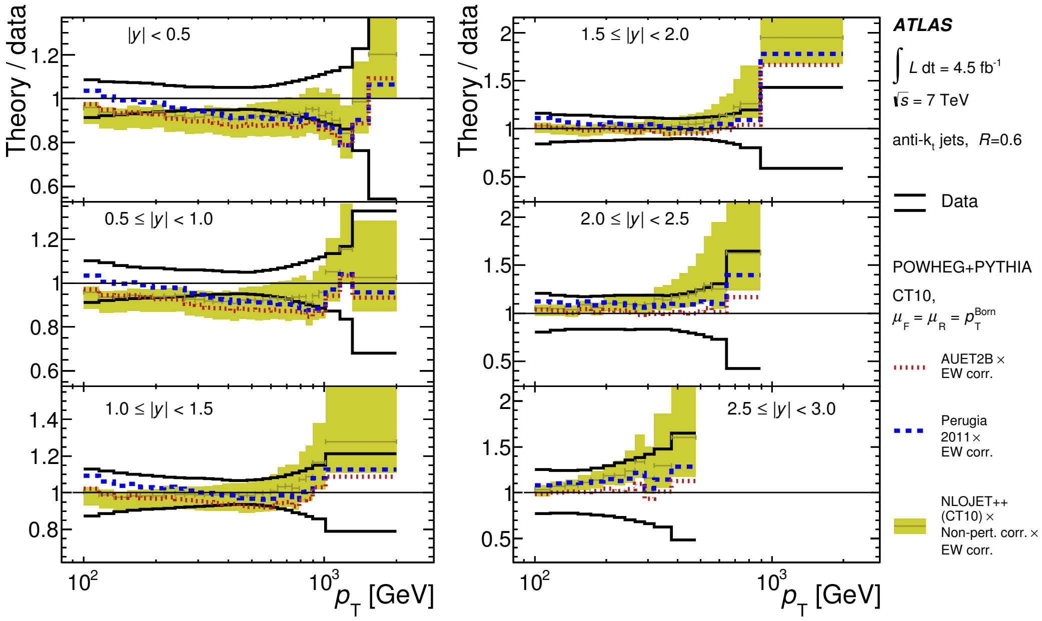

Figure 13. Ratio of predictions from POWHEG to the measured double-differential inclusive jet cross-section, shown as a function of the jet p_{T} in bins of jet rapidity, for anti-k_t jets with $R = 0.6$. The figure also shows the NLO pQCD prediction using NLOJET++ with the CT10 NLO PDF set, corrected for non-perturbative effects and electroweak effects. The POWHEG predictions use PYTHIA for the simulation of parton showers, hadronisation, and the underlying event with the AUET2B tune and the Perugia 2011 tune. Electroweak corrections are applied to the predictions. The data lines show the total uncertainty except the 1.8% uncertainty from the luminosity measurement.

p_{T}range	σ	$\delta_{\mathrm{stat}}^{\mathrm{data}}$	$\delta_{\mathrm{stat}}^{\mathrm{MC}}$	$u_{\text{in-situ}}$	$u_{\text{pile-up}}$	$u_{\text{close-by}}$	u_{flavour}	u_{JER}	u_{JAR}	u_{unfold}	$u_{\text{qual.}}$	u_{lumi}	NPC	u_{NP}	EWC
[GeV]	[pb/GeV]	%	%	%	%	%	%	%	%	%	%	%		%	
100–116	$4.23 \cdot 10^{3}$	0.55	0.69	$^{+3.9}_{-3.9}$	$^{+1.4}_{-1.3}$	$^{+0.8}_{-0.9}$	$^{+5.8}_{-5.5}$	3.0	0.0	0.1			1.02	$^{+0}_{-9}$	1.00
116–134	$2.02 \cdot 10^{3}$	0.75	0.48	$^{+3.8}_{-3.9}$	$^{+1.1}_{-1.2}$	$^{+0.8}_{-0.8}$	$^{+5.3}_{-5.3}$	2.4	0.0	0.1			1.01	$^{+0}_{-8}$	1.00
134–152	$9.88 \cdot 10^{2}$	0.88	0.39	$^{+3.9}_{-4.0}$	$^{+0.9}_{-1.1}$	$^{+0.7}_{-0.7}$	$^{+5.0}_{-5.0}$	1.9	0.0	0.0			1.01	$^{+0}_{-7}$	1.00
152–172	$5.02 \cdot 10^{2}$	0.71	0.43	$^{+4.0}_{-4.1}$	$^{+0.9}_{-0.9}$	$^{+0.7}_{-0.7}$	$^{+4.7}_{-4.6}$	1.6	0.0	0.0			1.01	$^{+0}_{-7}$	1.00
172–194	$2.58 \cdot 10^{2}$	0.56	0.36	$^{+4.1}_{-4.2}$	$^{+0.8}_{-0.9}$	$^{+0.8}_{-0.7}$	$^{+4.3}_{-4.2}$	1.4	0.0	0.0			1.01	$^{+0}_{-6}$	1.00
194–216	$1.37 \cdot 10^{2}$	0.72	0.36	$^{+4.3}_{-4.3}$	$^{+0.8}_{-0.8}$	$^{+0.8}_{-0.8}$	$^{+4.0}_{-3.9}$	1.3	0.0	0.0			1.00	$^{+0}_{-6}$	1.00
216–240	$7.55 \cdot 10^{1}$	0.52	0.34	$^{+4.3}_{-4.3}$	$^{+0.7}_{-0.7}$	$^{+0.9}_{-0.9}$	$^{+3.6}_{-3.5}$	1.2	0.0	0.0			1.00	$^{+0}_{-6}$	1.00
240–264	$4.28 \cdot 10^{1}$	0.67	0.37	$^{+4.3}_{-4.2}$	$^{+0.7}_{-0.6}$	$^{+1.0}_{-1.0}$	$^{+3.3}_{-3.2}$	1.1	0.0	0.0			1.00	$^{+0}_{-5}$	1.00
264–290	$2.47 \cdot 10^{1}$	0.86	0.34	$^{+4.2}_{-4.1}$	$^{+0.6}_{-0.6}$	$^{+1.1}_{-1.0}$	$^{+3.0}_{-3.0}$	1.1	0.0	0.0			1.00	$^{+0}_{-5}$	1.00
290–318	$1.44 \cdot 10^{1}$	1.0	0.32	$^{+4.2}_{-4.2}$	$^{+0.6}_{-0.7}$	$^{+1.1}_{-1.1}$	$^{+2.9}_{-2.9}$	1.1	0.0	0.0			1.00	$^{+0}_{-5}$	1.00
318–346	$8.40 \cdot 10^{0}$	0.98	0.46	$^{+4.1}_{-4.3}$	$^{+0.6}_{-0.7}$	$^{+1.1}_{-1.0}$	$^{+2.8}_{-2.8}$	1.0	0.0	0.0			1.00	$^{+0}_{-4}$	1.00
346–376	$5.14 \cdot 10^{0}$	0.54	0.58	$^{+4.2}_{-4.1}$	$^{+0.8}_{-0.8}$	$^{+1.0}_{-0.9}$	$^{+2.7}_{-2.7}$	0.9	0.1	0.0			1.00	$^{+0}_{-4}$	1.00
376–408	$3.11 \cdot 10^{0}$	0.30	0.49	$^{+4.4}_{-4.1}$	$^{+0.8}_{-0.7}$	$^{+0.9}_{-0.8}$	$^{+2.7}_{-2.6}$	0.9	0.1	0.0			1.00	$^{+0}_{-4}$	1.00
408–442	$1.89 \cdot 10^{0}$	0.33	0.40	$^{+4.5}_{-4.0}$	$^{+0.7}_{-0.6}$	$^{+0.6}_{-0.6}$	$^{+2.5}_{-2.4}$	0.9	0.1	0.0			1.00	$^{+0}_{-4}$	1.00
442–478	$1.13 \cdot 10^{0}$	0.33	0.38	$^{+4.3}_{-4.3}$	$^{+0.4}_{-0.4}$	$^{+0.4}_{-0.3}$	$^{+2.2}_{-2.1}$	0.9	0.0	0.0			1.00	$^{+0}_{-3}$	1.00
478–516	$6.83 \cdot 10^{-1}$	0.27	0.28	$^{+4.5}_{-4.4}$	$^{+0.2}_{-0.1}$	$^{+0.2}_{-0.2}$	$^{+2.0}_{-1.9}$	0.8	0.0	0.0	0.25	1.8	1.00	$^{+0}_{-3}$	1.01
516–556	$4.19 \cdot 10^{-1}$	0.34	0.23	$^{+4.7}_{-4.6}$	$^{+0.1}_{-0.0}$	$^{+0.1}_{-0.1}$	$^{+1.8}_{-1.7}$	0.8	0.0	0.0			1.00	$^{+0}_{-3}$	1.01
556–598	$2.53 \cdot 10^{-1}$	0.42	0.21	$^{+5.1}_{-5.0}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.7}_{-1.7}$	0.8	0.0	0.0			1.00	$^{+0}_{-3}$	1.01
598–642	$1.55 \cdot 10^{-1}$	0.53	0.20	$^{+5.5}_{-5.5}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.6}_{-1.6}$	0.9	0.0	0.0			1.00	$^{+0}_{-3}$	1.01
642–688	$9.48 \cdot 10^{-2}$	0.67	0.22	$^{+6.1}_{-6.0}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.6}_{-1.6}$	0.9	0.0	0.0			1.00	$^{+0}_{-2}$	1.02
688–736	$5.80 \cdot 10^{-2}$	0.83	0.22	$^{+6.8}_{-6.6}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.7}_{-1.7}$	0.9	0.0	0.0			1.00	$^{+0}_{-2}$	1.02
736–786	$3.61 \cdot 10^{-2}$	1.0	0.22	$^{+7.2}_{-7.2}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.7}_{-1.6}$	0.9	0.0	0.0			1.00	$^{+0}_{-2}$	1.03
786–838	$2.22 \cdot 10^{-2}$	1.3	0.22	$^{+8.0}_{-7.8}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.6}_{-1.6}$	0.9	0.0	0.0			1.00	$^{+0}_{-2}$	1.03
838–894	$1.31 \cdot 10^{-2}$	1.6	0.23	$^{+8.6}_{-8.4}$	$^{+0.1}_{-0.0}$	$^{+0.0}_{-0.0}$	$^{+1.5}_{-1.5}$	1.0	0.0	0.0			1.00	$^{+0}_{-2}$	1.04
894–952	$7.94 \cdot 10^{-3}$	2.1	0.26	$^{+9.3}_{-8.9}$	$^{+0.1}_{-0.0}$	$^{+0.0}_{-0.0}$	$^{+1.4}_{-1.4}$	1.0	0.0	0.1			1.00	$^{+0}_{-2}$	1.04
952–1012	$4.98 \cdot 10^{-3}$	2.5	0.27	$^{+9.9}_{-9.7}$	$^{+0.1}_{-0.0}$	$^{+0.0}_{-0.0}$	$^{+1.3}_{-1.3}$	1.0	0.0	0.1			1.00	$^{+0}_{-2}$	1.05
1012–1076	$2.97 \cdot 10^{-3}$	3.3	0.37	$^{+11}_{-10}$	$^{+0.1}_{-0.0}$	$^{+0.0}_{-0.0}$	$^{+1.2}_{-1.2}$	1.0	0.0	0.1			1.00	$^{+0}_{-2}$	1.06
1076–1162	$1.67 \cdot 10^{-3}$	3.9	0.32	$^{+11}_{-11}$	$^{+0.1}_{-0.0}$	$^{+0.0}_{-0.0}$	$^{+1.1}_{-1.1}$	1.1	0.0	0.0			1.00	$^{+0}_{-2}$	1.06
1162–1310	$7.00 \cdot 10^{-4}$	5.3	0.25	$^{+12}_{-12}$	$^{+0.1}_{-0.0}$	$^{+0.0}_{-0.0}$	$^{+1.0}_{-0.9}$	1.3	0.0	1.0			1.00	$^{+0}_{-2}$	1.08
1310–1530	$1.55 \cdot 10^{-4}$	10	0.27	$^{+20}_{-21}$	$^{+0.1}_{-0.0}$	$^{+0.0}_{-0.0}$	$^{+0.9}_{-0.8}$	1.8	0.0	0.2			1.00	$^{+0}_{-2}$	1.10
1530–1992	$1.17 \cdot 10^{-5}$	25	0.42	$^{+47}_{-39}$	$^{+0.0}_{-0.0}$	$^{+0.0}_{-0.0}$	$^{+0.8}_{-0.8}$	3.0	0.0	5.5			1.00	$^{+0}_{-2}$	1.12

Table 3. Measured double-differential inclusive jet cross-sections for jets with $R = 0.4$ in the rapidity bin $|y| < 0.5$. Here, σ is the measured double differential cross-section $\mathrm{d}^2\sigma/\mathrm{d}p_{\mathrm{T}}\mathrm{d}y$, averaged in each bin. All uncertainties are given in %. The variable $\delta_{\mathrm{stat}}^{\mathrm{data}}$ ($\delta_{\mathrm{stat}}^{\mathrm{MC}}$) is the statistical uncertainty from the data (MC simulation). The u components show the uncertainties due to the jet energy calibration from the in-situ, pile-up, close-by jet, and flavour components. The uncertainty due to the jet energy and angular resolution, the unfolding, the quality selection, and the integrated luminosity are also shown by the u components. While all columns are uncorrelated with each other, the in-situ, pile-up, and flavour uncertainties shown here are the sum in quadrature of multiple uncorrelated components. In the last three columns, the correction factors for non-perturbative effects (NPC) with their uncertainties (u_{NP}) and electroweak effects (EWC) are shown.

JHEP09(2015)141

$p_T$range [GeV]	σ [pb/GeV]	δ_{stat}^{data} %	δ_{stat}^{MC} %	$u_{in-situ}$ %	$u_{pile-up}$ %	$u_{close-by}$ %	$u_{flavour}$ %	u_{JER} %	u_{JAR} %	u_{unfold} %	$u_{qual.}$ %	u_{lumi} %	NPC	u_{NP} %	EWC
100–116	$4.03 \cdot 10^{3}$	0.55	0.91	$^{+4.4}_{-4.5}$	$^{+1.4}_{-1.2}$	$^{+0.8}_{-0.8}$	$^{+6.4}_{-5.9}$	3.0	0.2	0.1			1.02	$^{+0}_{-9}$	1.00
116–134	$1.90 \cdot 10^{3}$	0.77	0.52	$^{+4.2}_{-4.2}$	$^{+1.1}_{-1.1}$	$^{+0.8}_{-0.8}$	$^{+5.6}_{-5.3}$	2.5	0.1	0.1			1.01	$^{+0}_{-8}$	1.00
134–152	$9.31 \cdot 10^{2}$	0.92	0.40	$^{+4.3}_{-4.2}$	$^{+1.1}_{-1.0}$	$^{+0.8}_{-0.7}$	$^{+5.1}_{-4.8}$	2.2	0.1	0.0			1.01	$^{+0}_{-7}$	1.00
152–172	$4.67 \cdot 10^{2}$	0.72	0.37	$^{+4.4}_{-4.3}$	$^{+1.0}_{-1.0}$	$^{+0.7}_{-0.7}$	$^{+4.8}_{-4.6}$	1.9	0.1	0.0			1.01	$^{+0}_{-7}$	1.00
172–194	$2.39 \cdot 10^{2}$	0.57	0.38	$^{+4.4}_{-4.5}$	$^{+0.9}_{-0.9}$	$^{+0.7}_{-0.7}$	$^{+4.5}_{-4.4}$	1.6	0.1	0.0			1.00	$^{+0}_{-6}$	1.00
194–216	$1.26 \cdot 10^{2}$	0.73	0.37	$^{+4.5}_{-4.5}$	$^{+0.8}_{-0.8}$	$^{+0.8}_{-0.8}$	$^{+4.3}_{-4.2}$	1.4	0.0	0.0			1.00	$^{+0}_{-6}$	1.00
216–240	$6.89 \cdot 10^{1}$	0.54	0.33	$^{+4.6}_{-4.6}$	$^{+0.8}_{-0.7}$	$^{+0.9}_{-0.9}$	$^{+4.0}_{-3.9}$	1.3	0.0	0.0			1.00	$^{+0}_{-6}$	1.00
240–264	$3.86 \cdot 10^{1}$	0.70	0.35	$^{+4.6}_{-4.5}$	$^{+0.7}_{-0.6}$	$^{+1.0}_{-1.0}$	$^{+3.7}_{-3.5}$	1.3	0.0	0.0			1.00	$^{+0}_{-5}$	1.00
264–290	$2.22 \cdot 10^{1}$	0.91	0.39	$^{+4.6}_{-4.5}$	$^{+0.6}_{-0.6}$	$^{+1.1}_{-1.1}$	$^{+3.3}_{-3.1}$	1.2	0.0	0.0			1.00	$^{+0}_{-5}$	1.00
290–318	$1.28 \cdot 10^{1}$	1.2	0.37	$^{+4.5}_{-4.4}$	$^{+0.6}_{-0.6}$	$^{+1.1}_{-1.1}$	$^{+2.8}_{-2.7}$	1.2	0.0	0.0			1.00	$^{+0}_{-5}$	1.00
318–346	$7.41 \cdot 10^{0}$	1.1	0.50	$^{+4.5}_{-4.4}$	$^{+0.7}_{-0.7}$	$^{+1.1}_{-1.1}$	$^{+2.5}_{-2.5}$	1.1	0.0	0.0			1.00	$^{+0}_{-4}$	1.00
346–376	$4.50 \cdot 10^{0}$	0.58	0.62	$^{+4.2}_{-4.6}$	$^{+0.7}_{-0.8}$	$^{+0.9}_{-1.0}$	$^{+2.2}_{-2.3}$	1.0	0.0	0.0			1.00	$^{+0}_{-4}$	1.00
376–408	$2.71 \cdot 10^{0}$	0.31	0.49	$^{+4.3}_{-4.5}$	$^{+0.7}_{-0.8}$	$^{+0.8}_{-0.8}$	$^{+2.1}_{-2.1}$	1.1	0.0	0.0			1.00	$^{+0}_{-4}$	1.00
408–442	$1.63 \cdot 10^{0}$	0.36	0.42	$^{+4.4}_{-4.4}$	$^{+0.6}_{-0.6}$	$^{+0.6}_{-0.6}$	$^{+2.0}_{-2.0}$	1.1	0.0	0.0			1.00	$^{+0}_{-3}$	1.00
442–478	$9.69 \cdot 10^{-1}$	0.37	0.36	$^{+4.5}_{-4.5}$	$^{+0.4}_{-0.4}$	$^{+0.3}_{-0.3}$	$^{+1.8}_{-1.8}$	1.1	0.0	0.0	0.25	1.8	1.00	$^{+0}_{-3}$	1.00
478–516	$5.81 \cdot 10^{-1}$	0.30	0.28	$^{+4.7}_{-4.7}$	$^{+0.2}_{-0.2}$	$^{+0.2}_{-0.2}$	$^{+1.7}_{-1.7}$	1.1	0.0	0.0			1.00	$^{+0}_{-3}$	1.00
516–556	$3.46 \cdot 10^{-1}$	0.37	0.25	$^{+5.2}_{-5.0}$	$^{+0.1}_{-0.1}$	$^{+0.1}_{-0.1}$	$^{+1.6}_{-1.5}$	1.1	0.0	0.0			1.00	$^{+0}_{-3}$	1.00
556–598	$2.07 \cdot 10^{-1}$	0.47	0.23	$^{+5.6}_{-5.4}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.5}_{-1.4}$	1.1	0.0	0.0			1.00	$^{+0}_{-3}$	1.01
598–642	$1.23 \cdot 10^{-1}$	0.57	0.20	$^{+6.1}_{-5.9}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.4}_{-1.3}$	1.1	0.0	0.0			1.00	$^{+0}_{-3}$	1.01
642–688	$7.40 \cdot 10^{-2}$	0.74	0.21	$^{+6.6}_{-6.4}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.3}_{-1.3}$	1.1	0.0	0.0			1.00	$^{+0}_{-3}$	1.01
688–736	$4.45 \cdot 10^{-2}$	0.94	0.23	$^{+7.2}_{-7.1}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.2}_{-1.2}$	1.1	0.0	0.0			1.00	$^{+0}_{-3}$	1.01
736–786	$2.64 \cdot 10^{-2}$	1.2	0.23	$^{+8.0}_{-7.8}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.2}_{-1.1}$	1.2	0.0	0.0			1.00	$^{+0}_{-2}$	1.02
786–838	$1.57 \cdot 10^{-2}$	1.5	0.24	$^{+8.7}_{-8.5}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.1}_{-1.1}$	1.2	0.0	0.0			1.00	$^{+0}_{-2}$	1.02
838–894	$9.47 \cdot 10^{-3}$	1.9	0.26	$^{+9.5}_{-9.2}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.1}_{-1.0}$	1.3	0.0	0.0			1.00	$^{+0}_{-2}$	1.02
894–952	$5.26 \cdot 10^{-3}$	2.5	0.28	$^{+10}_{-9.9}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.0}_{-1.0}$	1.4	0.0	0.0			1.00	$^{+0}_{-2}$	1.03
952–1012	$2.99 \cdot 10^{-3}$	3.3	0.39	$^{+11}_{-10}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.0}_{-0.9}$	1.5	0.0	0.1			1.00	$^{+0}_{-2}$	1.03
1012–1162	$1.12 \cdot 10^{-3}$	4.0	0.27	$^{+12}_{-12}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.9}_{-0.9}$	1.6	0.0	0.1			1.00	$^{+0}_{-2}$	1.04
1162–1310	$2.56 \cdot 10^{-4}$	8.2	0.32	$^{+14}_{-14}$	$^{+0.0}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.8}_{-0.8}$	1.7	0.0	0.2			1.00	$^{+0}_{-2}$	1.05
1310–1992	$2.20 \cdot 10^{-5}$	14	0.31	$^{+29}_{-28}$	$^{+0.0}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.6}_{-0.7}$	3.7	0.0	0.8			1.00	$^{+0}_{-2}$	1.06

Table 4. Measured double-differential inclusive jet cross-sections for jets with $R = 0.4$ in the rapidity bin $0.5 \leq |y| < 1.0$. See caption of table 3 for details.

p_{T}range	σ	$\delta_{\text{stat}}^{\text{data}}$	$\delta_{\text{stat}}^{\text{MC}}$	$u_{\text{in-situ}}$	$u_{\text{pile-up}}$	$u_{\text{close-by}}$	u_{flavour}	u_{JER}	u_{JAR}	u_{unfold}	$u_{\text{qual.}}$	u_{lumi}	NPC	u_{NP}	EWC
[GeV]	[pb/GeV]	%	%	%	%	%	%	%	%	%	%	%		%	
100–116	$3.33 \cdot 10^{3}$	0.61	0.73	$^{+7.1}_{-6.3}$	$^{+1.7}_{-1.2}$	$^{+0.8}_{-0.8}$	$^{+6.5}_{-5.8}$	3.4	0.4	0.1	0.25	1.8	1.01	$^{+0}_{-8}$	1.00
116–134	$1.56 \cdot 10^{3}$	0.85	0.56	$^{+6.6}_{-6.2}$	$^{+1.2}_{-1.1}$	$^{+0.8}_{-0.8}$	$^{+5.9}_{-5.3}$	2.9	0.3	0.1			1.01	$^{+0}_{-7}$	1.00
134–152	$7.58 \cdot 10^{2}$	1.0	0.42	$^{+6.5}_{-6.4}$	$^{+1.0}_{-1.0}$	$^{+0.7}_{-0.7}$	$^{+5.4}_{-4.9}$	2.4	0.1	0.0			1.00	$^{+0}_{-7}$	1.00
152–172	$3.86 \cdot 10^{2}$	0.78	0.40	$^{+6.7}_{-6.6}$	$^{+0.9}_{-0.9}$	$^{+0.7}_{-0.7}$	$^{+4.9}_{-4.7}$	2.0	0.1	0.0			1.00	$^{+0}_{-6}$	1.00
172–194	$1.92 \cdot 10^{2}$	0.63	0.41	$^{+7.0}_{-6.8}$	$^{+0.9}_{-0.9}$	$^{+0.7}_{-0.7}$	$^{+4.6}_{-4.4}$	1.8	0.1	0.0			1.00	$^{+0}_{-6}$	1.00
194–216	$9.88 \cdot 10^{1}$	0.83	0.45	$^{+7.2}_{-7.0}$	$^{+0.9}_{-0.8}$	$^{+0.8}_{-0.8}$	$^{+4.4}_{-4.2}$	1.7	0.1	0.0			1.00	$^{+0}_{-5}$	1.00
216–240	$5.33 \cdot 10^{1}$	0.61	0.42	$^{+7.2}_{-7.0}$	$^{+0.8}_{-0.8}$	$^{+1.0}_{-0.9}$	$^{+4.1}_{-3.9}$	1.6	0.1	0.0			1.00	$^{+0}_{-5}$	1.00
240–264	$2.92 \cdot 10^{1}$	0.79	0.43	$^{+7.2}_{-6.9}$	$^{+0.7}_{-0.7}$	$^{+1.1}_{-1.0}$	$^{+3.8}_{-3.6}$	1.5	0.1	0.0			1.00	$^{+0}_{-5}$	1.00
264–290	$1.65 \cdot 10^{1}$	1.0	0.43	$^{+7.0}_{-6.7}$	$^{+0.7}_{-0.7}$	$^{+1.2}_{-1.1}$	$^{+3.4}_{-3.2}$	1.5	0.1	0.0			1.01	$^{+0}_{-5}$	1.00
290–318	$9.29 \cdot 10^{0}$	1.3	0.44	$^{+6.9}_{-6.4}$	$^{+0.7}_{-0.7}$	$^{+1.3}_{-1.1}$	$^{+2.9}_{-2.7}$	1.5	0.1	0.0			1.01	$^{+0}_{-5}$	1.00
318–346	$5.33 \cdot 10^{0}$	1.3	0.52	$^{+7.0}_{-6.3}$	$^{+0.8}_{-0.7}$	$^{+1.3}_{-1.1}$	$^{+2.5}_{-2.3}$	1.5	0.1	0.0			1.01	$^{+0}_{-4}$	1.00
346–376	$3.12 \cdot 10^{0}$	0.68	0.59	$^{+6.9}_{-6.1}$	$^{+0.8}_{-0.7}$	$^{+1.1}_{-1.0}$	$^{+2.2}_{-2.0}$	1.5	0.1	0.0			1.01	$^{+0}_{-4}$	1.00
376–408	$1.82 \cdot 10^{0}$	0.40	0.50	$^{+6.7}_{-6.2}$	$^{+0.8}_{-0.8}$	$^{+0.9}_{-0.8}$	$^{+2.0}_{-1.8}$	1.4	0.1	0.0			1.01	$^{+0}_{-4}$	1.00
408–442	$1.05 \cdot 10^{0}$	0.42	0.51	$^{+6.4}_{-6.4}$	$^{+0.7}_{-0.7}$	$^{+0.6}_{-0.6}$	$^{+1.8}_{-1.8}$	1.3	0.1	0.0			1.01	$^{+0}_{-4}$	1.00
442–478	$6.08 \cdot 10^{-1}$	0.44	0.42	$^{+6.3}_{-6.4}$	$^{+0.4}_{-0.5}$	$^{+0.4}_{-0.3}$	$^{+1.7}_{-1.7}$	1.2	0.1	0.0			1.01	$^{+0}_{-4}$	1.00
478–516	$3.49 \cdot 10^{-1}$	0.38	0.32	$^{+6.7}_{-6.6}$	$^{+0.2}_{-0.2}$	$^{+0.2}_{-0.2}$	$^{+1.7}_{-1.7}$	1.3	0.1	0.0			1.01	$^{+0}_{-4}$	1.00
516–556	$1.97 \cdot 10^{-1}$	0.48	0.33	$^{+7.0}_{-6.9}$	$^{+0.0}_{-0.1}$	$^{+0.1}_{-0.1}$	$^{+1.6}_{-1.6}$	1.4	0.1	0.0			1.01	$^{+0}_{-3}$	1.00
556–598	$1.12 \cdot 10^{-1}$	0.61	0.30	$^{+7.3}_{-7.2}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.6}_{-1.5}$	1.5	0.1	0.0			1.01	$^{+0}_{-3}$	1.00
598–642	$6.21 \cdot 10^{-2}$	0.79	0.26	$^{+8.0}_{-7.5}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.5}_{-1.4}$	1.6	0.1	0.0			1.01	$^{+0}_{-3}$	1.00
642–688	$3.37 \cdot 10^{-2}$	1.0	0.28	$^{+8.7}_{-8.3}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.3}_{-1.3}$	1.7	0.1	0.0			1.01	$^{+0}_{-3}$	1.00
688–736	$1.85 \cdot 10^{-2}$	1.4	0.32	$^{+9.7}_{-9.1}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.2}_{-1.1}$	1.9	0.1	0.0			1.01	$^{+0}_{-3}$	1.00
736–786	$1.02 \cdot 10^{-2}$	1.8	0.34	$^{+10}_{-10}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.0}_{-1.0}$	2.0	0.1	0.0			1.01	$^{+0}_{-3}$	1.00
786–838	$5.34 \cdot 10^{-3}$	2.5	0.37	$^{+11}_{-11}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.9}_{-1.0}$	2.1	0.1	0.1			1.01	$^{+0}_{-3}$	1.00
838–894	$2.60 \cdot 10^{-3}$	3.4	0.40	$^{+12}_{-12}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.9}_{-0.9}$	2.2	0.1	0.0			1.01	$^{+0}_{-3}$	1.00
894–1012	$9.15 \cdot 10^{-4}$	4.6	0.35	$^{+13}_{-13}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.8}_{-0.9}$	2.2	0.1	1.1			1.01	$^{+0}_{-3}$	1.01
1012–1992	$3.18 \cdot 10^{-5}$	9.4	0.53	$^{+19}_{-17}$	$^{+0.1}_{-0.0}$	$^{+0.0}_{-0.0}$	$^{+0.9}_{-0.6}$	4.3	0.3	4.1			1.01	$^{+0}_{-3}$	1.01

Table 5. Measured double-differential inclusive jet cross-sections for jets with $R = 0.4$ in the rapidity bin $1.0 \leq |y| < 1.5$. See caption of table 3 for details.

JHEP09(2015)141

$p_T$range [GeV]	σ [pb/GeV]	δ_{stat}^{data} %	δ_{stat}^{MC} %	$u_{in\text{-}situ}$ %	$u_{pile\text{-}up}$ %	$u_{close\text{-}by}$ %	$u_{flavour}$ %	u_{JER} %	u_{JAR} %	u_{unfold} %	$u_{qual.}$ %	u_{lumi} %	NPC	u_{NP} %	EWC
100–116	$2.54 \cdot 10^3$	0.74	0.87	$^{+11}_{-9.6}$	$^{+1.7}_{-1.2}$	$^{+1.0}_{-0.8}$	$^{+6.0}_{-5.3}$	3.5	0.5	0.1			1.01	$^{+0}_{-8}$	1.00
116–134	$1.16 \cdot 10^3$	1.0	0.67	$^{+11}_{-9.6}$	$^{+1.5}_{-1.1}$	$^{+0.9}_{-0.7}$	$^{+5.9}_{-5.1}$	3.0	0.4	0.1			1.00	$^{+0}_{-7}$	1.00
134–152	$5.52 \cdot 10^2$	1.3	0.47	$^{+11}_{-10}$	$^{+1.3}_{-1.0}$	$^{+0.8}_{-0.7}$	$^{+5.5}_{-4.8}$	2.6	0.3	0.0			1.00	$^{+1}_{-6}$	1.00
152–172	$2.75 \cdot 10^2$	0.96	0.43	$^{+12}_{-11}$	$^{+1.2}_{-1.1}$	$^{+0.7}_{-0.7}$	$^{+5.0}_{-4.6}$	2.3	0.3	0.0			1.00	$^{+1}_{-6}$	1.00
172–194	$1.37 \cdot 10^2$	0.76	0.45	$^{+12}_{-11}$	$^{+1.2}_{-1.0}$	$^{+0.8}_{-0.8}$	$^{+4.4}_{-4.1}$	2.1	0.3	0.0			1.00	$^{+0}_{-5}$	1.00
194–216	$6.81 \cdot 10^1$	1.1	0.47	$^{+12}_{-11}$	$^{+1.0}_{-0.9}$	$^{+0.9}_{-0.9}$	$^{+3.8}_{-3.6}$	1.8	0.3	0.0			1.00	$^{+0}_{-5}$	1.00
216–240	$3.56 \cdot 10^1$	0.77	0.44	$^{+12}_{-11}$	$^{+0.9}_{-0.8}$	$^{+1.0}_{-1.0}$	$^{+3.4}_{-3.2}$	1.7	0.2	0.0			1.00	$^{+0}_{-5}$	1.00
240–264	$1.90 \cdot 10^1$	0.99	0.42	$^{+12}_{-11}$	$^{+0.8}_{-0.8}$	$^{+1.2}_{-1.1}$	$^{+3.1}_{-3.0}$	1.7	0.2	0.0			1.01	$^{+0}_{-5}$	1.00
264–290	$1.01 \cdot 10^1$	1.3	0.53	$^{+12}_{-11}$	$^{+0.8}_{-0.7}$	$^{+1.3}_{-1.2}$	$^{+2.9}_{-2.9}$	1.6	0.2	0.0			1.01	$^{+0}_{-5}$	1.00
290–318	$5.30 \cdot 10^0$	1.8	0.49	$^{+12}_{-11}$	$^{+0.8}_{-0.8}$	$^{+1.3}_{-1.2}$	$^{+2.7}_{-2.7}$	1.6	0.2	0.0			1.01	$^{+0}_{-4}$	1.00
318–346	$2.91 \cdot 10^0$	1.8	0.64	$^{+12}_{-11}$	$^{+0.9}_{-0.9}$	$^{+1.3}_{-1.2}$	$^{+2.5}_{-2.5}$	1.6	0.2	0.0			1.01	$^{+0}_{-4}$	1.00
346–376	$1.63 \cdot 10^0$	0.96	0.70	$^{+11}_{-11}$	$^{+0.9}_{-1.0}$	$^{+1.2}_{-1.0}$	$^{+2.4}_{-2.4}$	1.7	0.3	0.0	0.25	1.8	1.01	$^{+0}_{-4}$	0.99
376–408	$8.63 \cdot 10^{-1}$	0.56	0.65	$^{+11}_{-11}$	$^{+0.9}_{-1.0}$	$^{+1.0}_{-0.8}$	$^{+2.3}_{-2.3}$	1.7	0.3	0.0			1.01	$^{+0}_{-4}$	0.99
408–442	$4.52 \cdot 10^{-1}$	0.67	0.73	$^{+11}_{-11}$	$^{+0.8}_{-0.9}$	$^{+0.7}_{-0.6}$	$^{+2.2}_{-2.2}$	1.7	0.3	0.0			1.01	$^{+0}_{-4}$	0.99
442–478	$2.32 \cdot 10^{-1}$	0.73	0.66	$^{+11}_{-11}$	$^{+0.5}_{-0.6}$	$^{+0.4}_{-0.4}$	$^{+2.1}_{-2.0}$	1.8	0.3	0.0			1.01	$^{+0}_{-4}$	0.99
478–516	$1.16 \cdot 10^{-1}$	0.67	0.52	$^{+12}_{-11}$	$^{+0.2}_{-0.2}$	$^{+0.2}_{-0.2}$	$^{+2.0}_{-1.9}$	2.0	0.3	0.0			1.01	$^{+0}_{-4}$	0.99
516–556	$5.80 \cdot 10^{-2}$	0.89	0.64	$^{+12}_{-11}$	$^{+0.1}_{-0.1}$	$^{+0.1}_{-0.1}$	$^{+1.9}_{-1.8}$	2.3	0.3	0.1			1.01	$^{+0}_{-3}$	0.99
556–598	$2.68 \cdot 10^{-2}$	1.2	0.56	$^{+13}_{-12}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.8}_{-1.7}$	2.5	0.3	0.0			1.01	$^{+0}_{-3}$	0.99
598–642	$1.24 \cdot 10^{-2}$	1.8	0.54	$^{+14}_{-13}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.6}_{-1.6}$	2.8	0.3	0.0			1.01	$^{+0}_{-3}$	0.99
642–688	$5.53 \cdot 10^{-3}$	2.6	0.63	$^{+14}_{-14}$	$^{+0.2}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.5}_{-1.4}$	3.0	0.3	0.1			1.01	$^{+0}_{-3}$	0.99
688–736	$2.34 \cdot 10^{-3}$	3.8	0.79	$^{+15}_{-14}$	$^{+0.2}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.3}_{-1.3}$	3.2	0.3	0.2			1.01	$^{+0}_{-3}$	0.99
736–894	$4.50 \cdot 10^{-4}$	5.7	0.68	$^{+18}_{-18}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.1}_{-1.1}$	3.4	0.3	0.0			1.01	$^{+0}_{-3}$	0.99
894–1992	$2.80 \cdot 10^{-6}$	28	3.6	$^{+31}_{-26}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.4}_{-0.8}$	8.0	0.3	9.2			1.01	$^{+0}_{-3}$	0.99

Table 6. Measured double-differential inclusive jet cross-sections for jets with $R = 0.4$ in the rapidity bin $1.5 \leq |y| < 2.0$. See caption of table 3 for details.

JHEP09(2015)141

$p_T$range [GeV]	σ [pb/GeV]	$\delta^{\rm data}_{\rm stat}$ %	$\delta^{\rm MC}_{\rm stat}$ %	$u_{\rm in\text{-}situ}$ %	$u_{\rm pile\text{-}up}$ %	$u_{\rm close\text{-}by}$ %	$u_{\rm flavour}$ %	$u_{\rm JER}$ %	$u_{\rm JAR}$ %	$u_{\rm unfold}$ %	$u_{\rm qual.}$ %	$u_{\rm lumi}$ %	NPC	$u_{\rm NP}$ %	EWC
100–116	$1.87 \cdot 10^{3}$	0.88	0.79	$^{+17}_{-14}$	$^{+1.7}_{-1.6}$	$^{+0.7}_{-0.7}$	$^{+4.4}_{-4.2}$	4.8	0.8	0.0			1.01	$^{+1}_{-7}$	1.00
116–134	$7.83 \cdot 10^{2}$	1.2	0.96	$^{+17}_{-15}$	$^{+1.3}_{-1.3}$	$^{+0.7}_{-0.7}$	$^{+3.9}_{-3.7}$	3.7	0.7	0.0			1.00	$^{+1}_{-6}$	1.00
134–152	$3.63 \cdot 10^{2}$	1.6	0.52	$^{+17}_{-15}$	$^{+1.3}_{-1.2}$	$^{+0.6}_{-0.6}$	$^{+3.5}_{-3.2}$	3.2	0.6	0.0			1.00	$^{+1}_{-5}$	1.00
152–172	$1.65 \cdot 10^{2}$	1.3	0.50	$^{+18}_{-16}$	$^{+1.3}_{-1.2}$	$^{+0.6}_{-0.6}$	$^{+3.2}_{-2.9}$	2.9	0.6	0.0			1.00	$^{+1}_{-5}$	1.00
172–194	$7.82 \cdot 10^{1}$	1.0	0.51	$^{+19}_{-17}$	$^{+1.3}_{-1.2}$	$^{+0.7}_{-0.6}$	$^{+2.8}_{-2.6}$	2.8	0.6	0.0			1.00	$^{+0}_{-5}$	1.00
194–216	$3.57 \cdot 10^{1}$	1.5	0.55	$^{+20}_{-17}$	$^{+1.3}_{-1.1}$	$^{+0.9}_{-0.7}$	$^{+2.4}_{-2.3}$	2.7	0.6	0.0			1.01	$^{+0}_{-5}$	1.00
216–240	$1.69 \cdot 10^{1}$	1.2	0.71	$^{+20}_{-18}$	$^{+1.1}_{-1.1}$	$^{+0.9}_{-0.8}$	$^{+2.1}_{-2.2}$	2.6	0.5	0.0			1.01	$^{+0}_{-5}$	1.00
240–264	$7.99 \cdot 10^{0}$	1.7	0.66	$^{+20}_{-18}$	$^{+1.0}_{-1.1}$	$^{+1.0}_{-1.0}$	$^{+2.0}_{-2.1}$	2.6	0.5	0.0			1.01	$^{+0}_{-5}$	1.00
264–290	$3.93 \cdot 10^{0}$	2.3	0.71	$^{+20}_{-18}$	$^{+0.9}_{-1.0}$	$^{+1.0}_{-1.0}$	$^{+1.9}_{-2.0}$	2.7	0.4	0.0			1.01	$^{+0}_{-5}$	0.99
290–318	$1.73 \cdot 10^{0}$	3.4	0.71	$^{+20}_{-18}$	$^{+1.0}_{-1.0}$	$^{+1.0}_{-1.0}$	$^{+2.0}_{-1.9}$	3.0	0.4	0.0	0.25	1.8	1.01	$^{+0}_{-5}$	0.99
318–346	$7.78 \cdot 10^{-1}$	3.7	1.1	$^{+20}_{-17}$	$^{+1.2}_{-1.1}$	$^{+1.0}_{-0.9}$	$^{+2.0}_{-1.8}$	3.3	0.4	0.0			1.01	$^{+0}_{-5}$	0.99
346–376	$3.66 \cdot 10^{-1}$	2.1	1.9	$^{+20}_{-18}$	$^{+1.3}_{-1.2}$	$^{+0.9}_{-0.8}$	$^{+2.0}_{-2.0}$	3.5	0.5	0.0			1.01	$^{+0}_{-5}$	0.99
376–408	$1.53 \cdot 10^{-1}$	1.3	1.3	$^{+21}_{-19}$	$^{+1.3}_{-1.2}$	$^{+0.7}_{-0.6}$	$^{+2.0}_{-2.2}$	3.7	0.5	0.0			1.01	$^{+0}_{-5}$	0.99
408–442	$6.28 \cdot 10^{-2}$	1.9	1.6	$^{+22}_{-20}$	$^{+1.0}_{-0.9}$	$^{+0.4}_{-0.4}$	$^{+1.9}_{-2.3}$	3.9	0.5	0.0			1.01	$^{+0}_{-5}$	0.99
442–478	$2.45 \cdot 10^{-2}$	2.6	1.5	$^{+24}_{-21}$	$^{+0.6}_{-0.6}$	$^{+0.2}_{-0.2}$	$^{+1.8}_{-2.2}$	4.4	0.5	0.0			1.01	$^{+0}_{-5}$	0.99
478–516	$8.45 \cdot 10^{-3}$	2.5	1.5	$^{+27}_{-23}$	$^{+0.3}_{-0.3}$	$^{+0.1}_{-0.1}$	$^{+1.7}_{-2.0}$	5.0	0.5	0.0			1.01	$^{+0}_{-5}$	0.99
516–556	$2.92 \cdot 10^{-3}$	4.3	2.3	$^{+30}_{-25}$	$^{+0.1}_{-0.2}$	$^{+0.0}_{-0.0}$	$^{+1.7}_{-1.9}$	5.7	0.5	0.1			1.01	$^{+0}_{-5}$	0.99
556–642	$5.60 \cdot 10^{-4}$	7.2	2.6	$^{+32}_{-28}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.6}_{-1.7}$	6.3	0.6	0.1			1.01	$^{+0}_{-5}$	0.99
642–894	$9.83 \cdot 10^{-6}$	33	5.2	$^{+56}_{-47}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.1}_{-0.6}$	16	2.7	0.2			1.01	$^{+0}_{-5}$	0.98

Table 7. Measured double-differential inclusive jet cross-sections for jets with $R = 0.4$ in the rapidity bin $2.0 \leq |y| < 2.5$. See caption of table 3 for details.

$p_T$range [GeV]	σ [pb/GeV]	$\delta^{\rm data}_{\rm stat}$ %	$\delta^{\rm MC}_{\rm stat}$ %	$u_{\rm in\text{-}situ}$ %	$u_{\rm pile\text{-}up}$ %	$u_{\rm close\text{-}by}$ %	$u_{\rm flavour}$ %	$u_{\rm JER}$ %	$u_{\rm JAR}$ %	$u_{\rm unfold}$ %	$u_{\rm qual.}$ %	$u_{\rm lumi}$ %	NPC	$u_{\rm NP}$ %	EWC
100–116	$1.04 \cdot 10^{3}$	1.2	1.1	$^{+24}_{-20}$	$^{+3.1}_{-2.1}$	$^{+0.8}_{-0.7}$	$^{+3.9}_{-3.5}$	5.3	1.5	0.1			1.00	$^{+1}_{-6}$	1.00
116–134	$4.16 \cdot 10^{2}$	1.7	0.95	$^{+25}_{-21}$	$^{+2.4}_{-1.9}$	$^{+0.7}_{-0.6}$	$^{+3.3}_{-3.1}$	5.0	1.5	0.1			1.00	$^{+1}_{-5}$	1.00
134–152	$1.60 \cdot 10^{2}$	2.4	0.86	$^{+26}_{-22}$	$^{+1.9}_{-2.0}$	$^{+0.7}_{-0.6}$	$^{+2.6}_{-2.8}$	4.6	1.3	0.1			1.00	$^{+1}_{-5}$	1.00
152–172	$6.41 \cdot 10^{1}$	2.0	0.84	$^{+28}_{-24}$	$^{+1.9}_{-1.9}$	$^{+0.8}_{-0.7}$	$^{+2.3}_{-2.5}$	4.6	1.3	0.0			1.00	$^{+1}_{-5}$	1.00
172–194	$2.46 \cdot 10^{1}$	1.8	0.97	$^{+31}_{-25}$	$^{+2.0}_{-1.8}$	$^{+0.9}_{-0.9}$	$^{+2.1}_{-2.1}$	4.9	1.3	0.1			1.00	$^{+0}_{-5}$	1.00
194–216	$9.40 \cdot 10^{0}$	2.8	1.3	$^{+34}_{-27}$	$^{+2.0}_{-1.8}$	$^{+1.0}_{-1.1}$	$^{+2.0}_{-1.9}$	5.1	1.3	0.1	0.25	1.8	1.01	$^{+0}_{-5}$	1.00
216–240	$3.40 \cdot 10^{0}$	2.5	1.1	$^{+36}_{-28}$	$^{+2.0}_{-1.8}$	$^{+1.3}_{-1.2}$	$^{+2.0}_{-2.0}$	5.4	1.1	0.0			1.01	$^{+0}_{-5}$	0.99
240–264	$1.18 \cdot 10^{0}$	4.0	1.9	$^{+40}_{-30}$	$^{+1.9}_{-1.8}$	$^{+1.6}_{-1.3}$	$^{+2.0}_{-1.9}$	6.1	1.1	0.0			1.01	$^{+0}_{-6}$	0.99
264–290	$4.11 \cdot 10^{-1}$	6.6	2.4	$^{+42}_{-31}$	$^{+1.7}_{-1.7}$	$^{+1.6}_{-1.3}$	$^{+2.0}_{-1.8}$	7.0	1.2	0.0			1.01	$^{+0}_{-6}$	0.99
290–318	$1.46 \cdot 10^{-1}$	10	2.1	$^{+45}_{-32}$	$^{+1.4}_{-1.7}$	$^{+1.5}_{-1.3}$	$^{+1.9}_{-1.8}$	8.0	1.4	0.1			1.01	$^{+0}_{-6}$	0.99
318–376	$2.82 \cdot 10^{-2}$	15	2.6	$^{+49}_{-34}$	$^{+1.4}_{-2.0}$	$^{+1.2}_{-1.0}$	$^{+1.9}_{-1.9}$	10	2.1	0.0			1.01	$^{+0}_{-6}$	0.99
376–478	$6.88 \cdot 10^{-4}$	12	7.9	$^{+62}_{-46}$	$^{+5.3}_{-3.1}$	$^{+0.6}_{-0.5}$	$^{+4.3}_{-1.4}$	17	6.8	0.6			1.01	$^{+0}_{-6}$	0.99

Table 8. Measured double-differential inclusive jet cross-sections for jets with $R = 0.4$ in the rapidity bin $2.5 \leq |y| < 3.0$. See caption of table 3 for details.

JHEP09(2015)141

$p_T$range	σ	$\delta_{\rm stat}^{\rm data}$	$\delta_{\rm stat}^{\rm MC}$	$u_{\text{in-situ}}$	$u_{\text{pile-up}}$	$u_{\text{close-by}}$	u_{flavour}	$u_{\rm JER}$	$u_{\rm JAR}$	$u_{\rm unfold}$	$u_{\rm qual.}$	$u_{\rm lumi}$	NPC	$u_{\rm NP}$	EWC
[GeV]	[pb/GeV]	%	%	%	%	%	%	%	%	%	%	%		%	
100–116	$5.52 \cdot 10^3$	0.54	0.73	$^{+4.8}_{-5.1}$	$^{+1.5}_{-1.7}$	$^{+1.3}_{-1.3}$	$^{+6.0}_{-5.8}$	3.1	0.1	0.1			1.06	$^{+0}_{-6}$	1.00
116–134	$2.60 \cdot 10^3$	0.67	0.49	$^{+4.4}_{-4.6}$	$^{+1.2}_{-1.4}$	$^{+1.1}_{-1.1}$	$^{+5.7}_{-5.5}$	2.2	0.1	0.1			1.05	$^{+1}_{-5}$	1.00
134–152	$1.26 \cdot 10^3$	0.75	0.39	$^{+4.3}_{-4.3}$	$^{+1.1}_{-1.1}$	$^{+1.0}_{-1.0}$	$^{+5.5}_{-5.3}$	1.7	0.1	0.0			1.04	$^{+1}_{-5}$	1.00
152–172	$6.34 \cdot 10^2$	0.59	0.39	$^{+4.3}_{-4.2}$	$^{+1.1}_{-0.9}$	$^{+1.0}_{-0.9}$	$^{+5.4}_{-5.1}$	1.4	0.1	0.0			1.04	$^{+1}_{-4}$	1.00
172–194	$3.24 \cdot 10^2$	0.48	0.34	$^{+4.4}_{-4.1}$	$^{+1.0}_{-0.9}$	$^{+0.9}_{-0.9}$	$^{+5.1}_{-4.7}$	1.3	0.1	0.0			1.03	$^{+1}_{-4}$	1.00
194–216	$1.70 \cdot 10^2$	0.62	0.37	$^{+4.3}_{-4.0}$	$^{+0.9}_{-0.8}$	$^{+0.9}_{-0.9}$	$^{+4.5}_{-4.1}$	1.2	0.1	0.0			1.03	$^{+1}_{-3}$	1.00
216–240	$9.43 \cdot 10^1$	0.45	0.35	$^{+4.2}_{-4.1}$	$^{+0.9}_{-0.8}$	$^{+1.0}_{-1.0}$	$^{+3.8}_{-3.6}$	1.1	0.1	0.0			1.02	$^{+1}_{-3}$	1.00
240–264	$5.27 \cdot 10^1$	0.58	0.32	$^{+4.2}_{-4.2}$	$^{+0.8}_{-0.7}$	$^{+1.0}_{-1.0}$	$^{+3.3}_{-3.2}$	1.0	0.1	0.0			1.02	$^{+1}_{-3}$	1.00
264–290	$3.05 \cdot 10^1$	0.74	0.31	$^{+4.1}_{-4.1}$	$^{+0.7}_{-0.7}$	$^{+1.0}_{-1.0}$	$^{+3.0}_{-2.9}$	0.9	0.0	0.0			1.02	$^{+1}_{-3}$	1.00
290–318	$1.75 \cdot 10^1$	0.95	0.33	$^{+4.1}_{-4.1}$	$^{+0.8}_{-0.7}$	$^{+1.0}_{-1.0}$	$^{+2.8}_{-2.7}$	0.8	0.0	0.0			1.01	$^{+1}_{-2}$	1.00
318–346	$1.02 \cdot 10^1$	0.92	0.49	$^{+4.3}_{-4.0}$	$^{+0.8}_{-0.9}$	$^{+0.9}_{-0.9}$	$^{+2.7}_{-2.7}$	0.7	0.0	0.0			1.01	$^{+0}_{-2}$	1.00
346–376	$6.17 \cdot 10^0$	0.47	0.57	$^{+4.2}_{-4.2}$	$^{+0.8}_{-1.0}$	$^{+0.8}_{-0.8}$	$^{+2.6}_{-2.6}$	0.7	0.0	0.0			1.01	$^{+0}_{-2}$	1.00
376–408	$3.72 \cdot 10^0$	0.27	0.48	$^{+4.2}_{-4.4}$	$^{+0.8}_{-0.9}$	$^{+0.6}_{-0.6}$	$^{+2.4}_{-2.4}$	0.6	0.0	0.0			1.01	$^{+0}_{-2}$	1.00
408–442	$2.25 \cdot 10^0$	0.30	0.42	$^{+4.5}_{-4.4}$	$^{+0.7}_{-0.7}$	$^{+0.4}_{-0.4}$	$^{+2.2}_{-2.2}$	0.7	0.0	0.0			1.01	$^{+0}_{-2}$	1.00
442–478	$1.35 \cdot 10^0$	0.31	0.36	$^{+4.5}_{-4.3}$	$^{+0.4}_{-0.4}$	$^{+0.2}_{-0.2}$	$^{+2.0}_{-1.9}$	0.7	0.0	0.0			1.01	$^{+0}_{-2}$	1.00
478–516	$8.09 \cdot 10^{-1}$	0.25	0.28	$^{+4.7}_{-4.4}$	$^{+0.2}_{-0.1}$	$^{+0.1}_{-0.1}$	$^{+1.8}_{-1.7}$	0.7	0.0	0.0	0.25	1.8	1.01	$^{+0}_{-2}$	1.01
516–556	$4.92 \cdot 10^{-1}$	0.32	0.24	$^{+5.0}_{-4.8}$	$^{+0.1}_{-0.0}$	$^{+0.1}_{-0.0}$	$^{+1.6}_{-1.6}$	0.7	0.0	0.0			1.00	$^{+0}_{-2}$	1.01
556–598	$2.98 \cdot 10^{-1}$	0.39	0.22	$^{+5.3}_{-5.2}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.5}_{-1.5}$	0.7	0.0	0.0			1.00	$^{+0}_{-1}$	1.01
598–642	$1.82 \cdot 10^{-1}$	0.49	0.21	$^{+5.7}_{-5.7}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.4}_{-1.4}$	0.7	0.0	0.0			1.00	$^{+0}_{-1}$	1.02
642–688	$1.11 \cdot 10^{-1}$	0.62	0.22	$^{+6.4}_{-6.3}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.3}_{-1.3}$	0.7	0.0	0.0			1.00	$^{+0}_{-1}$	1.02
688–736	$6.74 \cdot 10^{-2}$	0.77	0.21	$^{+7.0}_{-6.9}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.3}_{-1.3}$	0.7	0.0	0.0			1.00	$^{+0}_{-1}$	1.02
736–786	$4.17 \cdot 10^{-2}$	0.94	0.21	$^{+7.6}_{-7.4}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.3}_{-1.3}$	0.7	0.0	0.0			1.00	$^{+0}_{-1}$	1.03
786–838	$2.53 \cdot 10^{-2}$	1.2	0.26	$^{+8.5}_{-8.1}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.2}_{-1.2}$	0.8	0.0	0.0			1.00	$^{+0}_{-1}$	1.03
838–894	$1.51 \cdot 10^{-2}$	1.5	0.23	$^{+9.2}_{-8.8}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.1}_{-1.1}$	0.8	0.0	0.0			1.00	$^{+0}_{-1}$	1.04
894–952	$9.08 \cdot 10^{-3}$	1.9	0.26	$^{+9.8}_{-9.4}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.1}_{-1.0}$	0.8	0.0	0.1			1.00	$^{+0}_{-1}$	1.05
952–1012	$5.61 \cdot 10^{-3}$	2.4	0.28	$^{+11}_{-10}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.0}_{-0.9}$	0.8	0.0	0.2			1.00	$^{+0}_{-1}$	1.05
1012–1076	$3.29 \cdot 10^{-3}$	3.1	0.34	$^{+12}_{-11}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.9}_{-0.9}$	0.8	0.0	0.4			1.00	$^{+0}_{-1}$	1.06
1076–1162	$1.85 \cdot 10^{-3}$	3.8	0.35	$^{+12}_{-11}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.8}_{-0.8}$	0.8	0.0	0.2			1.00	$^{+0}_{-1}$	1.07
1162–1310	$8.05 \cdot 10^{-4}$	5.0	0.28	$^{+13}_{-13}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.7}_{-0.7}$	1.0	0.0	2.7			1.00	$^{+0}_{-1}$	1.08
1310–1530	$1.72 \cdot 10^{-4}$	9.5	0.27	$^{+21}_{-21}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.7}_{-0.6}$	1.3	0.0	2.1			1.00	$^{+0}_{-1}$	1.10
1530–1992	$1.39 \cdot 10^{-5}$	24	0.52	$^{+46}_{-38}$	$^{+0.0}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.5}_{-0.6}$	2.5	0.0	8.5			1.00	$^{+0}_{-1}$	1.13

Table 9. Measured double-differential inclusive jet cross-sections for jets with $R = 0.6$ in the rapidity bin $|y| < 0.5$. Here, σ is the measured double differential cross-section $\mathrm{d}^2\sigma/\mathrm{d}p_{\rm T}\mathrm{d}y$, averaged in each bin. All uncertainties are given in %. The variable $\delta_{\rm stat}^{\rm data}$ ($\delta_{\rm stat}^{\rm MC}$) is the statistical uncertainty from the data (MC simulation). The u components show the uncertainties due to the jet energy calibration from the in-situ, pile-up, close-by jet, and flavour components. The uncertainty due to the jet energy and angular resolution, the unfolding, the quality selection, and the integrated luminosity are also shown by the u components. While all columns are uncorrelated with each other, the in-situ, pile-up, and flavour uncertainties shown here are the sum in quadrature of multiple uncorrelated components. In the last three columns, the correction factors for non-perturbative effects (NPC) with their uncertainties ($u_{\rm NP}$) and electroweak effects (EWC) are shown.

JHEP09(2015)141

p_{T}range [GeV]	σ [pb/GeV]	$\delta_{\mathrm{stat}}^{\mathrm{data}}$ %	$\delta_{\mathrm{stat}}^{\mathrm{MC}}$ %	$u_{\text{in-situ}}$ %	$u_{\text{pile-up}}$ %	$u_{\text{close-by}}$ %	u_{flavour} %	u_{JER} %	u_{JAR} %	u_{unfold} %	$u_{\mathrm{qual.}}$ %	u_{lumi} %	NPC	u_{NP} %	EWC
100–116	$5.14 \cdot 10^{3}$	0.57	0.75	$^{+5.7}_{-4.8}$	$^{+1.9}_{-1.4}$	$^{+1.6}_{-1.2}$	$^{+6.7}_{-5.8}$	4.1	0.6	0.1			1.06	$^{+0}_{-6}$	1.00
116–134	$2.41 \cdot 10^{3}$	0.70	0.55	$^{+5.6}_{-4.7}$	$^{+1.7}_{-1.3}$	$^{+1.3}_{-1.1}$	$^{+6.1}_{-5.3}$	3.2	0.5	0.1			1.05	$^{+1}_{-5}$	1.00
134–152	$1.16 \cdot 10^{3}$	0.79	0.45	$^{+5.0}_{-4.6}$	$^{+1.4}_{-1.2}$	$^{+1.0}_{-0.9}$	$^{+5.5}_{-5.0}$	2.3	0.3	0.0			1.04	$^{+1}_{-5}$	1.00
152–172	$5.75 \cdot 10^{2}$	0.62	0.37	$^{+4.6}_{-4.6}$	$^{+1.2}_{-1.1}$	$^{+0.9}_{-0.8}$	$^{+5.0}_{-4.9}$	1.8	0.2	0.0			1.03	$^{+1}_{-4}$	1.00
172–194	$2.93 \cdot 10^{2}$	0.51	0.37	$^{+4.7}_{-4.6}$	$^{+1.1}_{-1.0}$	$^{+0.9}_{-0.8}$	$^{+4.7}_{-4.6}$	1.5	0.2	0.0			1.03	$^{+1}_{-4}$	1.00
194–216	$1.54 \cdot 10^{2}$	0.63	0.37	$^{+4.8}_{-4.7}$	$^{+1.0}_{-1.0}$	$^{+0.9}_{-0.9}$	$^{+4.4}_{-4.2}$	1.4	0.1	0.0			1.03	$^{+1}_{-3}$	1.00
216–240	$8.33 \cdot 10^{1}$	0.48	0.34	$^{+4.7}_{-4.7}$	$^{+0.9}_{-0.9}$	$^{+1.0}_{-1.0}$	$^{+3.9}_{-3.8}$	1.2	0.1	0.0			1.02	$^{+1}_{-3}$	1.00
240–264	$4.63 \cdot 10^{1}$	0.63	0.33	$^{+4.6}_{-4.7}$	$^{+0.8}_{-0.9}$	$^{+1.0}_{-1.0}$	$^{+3.5}_{-3.5}$	1.0	0.1	0.0			1.02	$^{+1}_{-3}$	1.00
264–290	$2.69 \cdot 10^{1}$	0.80	0.34	$^{+4.7}_{-4.6}$	$^{+0.8}_{-0.8}$	$^{+1.1}_{-1.0}$	$^{+3.2}_{-3.1}$	1.0	0.1	0.0			1.02	$^{+1}_{-3}$	1.00
290–318	$1.54 \cdot 10^{1}$	1.0	0.37	$^{+4.7}_{-4.4}$	$^{+0.9}_{-0.8}$	$^{+1.0}_{-1.0}$	$^{+2.9}_{-2.8}$	1.0	0.1	0.0			1.01	$^{+1}_{-2}$	1.00
318–346	$9.08 \cdot 10^{0}$	0.94	0.46	$^{+4.8}_{-4.2}$	$^{+1.0}_{-0.9}$	$^{+0.9}_{-0.9}$	$^{+2.6}_{-2.5}$	1.0	0.1	0.0			1.01	$^{+1}_{-2}$	1.00
346–376	$5.41 \cdot 10^{0}$	0.50	0.62	$^{+4.7}_{-4.3}$	$^{+1.0}_{-0.9}$	$^{+0.8}_{-0.7}$	$^{+2.3}_{-2.2}$	0.9	0.1	0.0			1.01	$^{+0}_{-2}$	1.00
376–408	$3.21 \cdot 10^{0}$	0.28	0.47	$^{+4.5}_{-4.5}$	$^{+1.0}_{-0.9}$	$^{+0.6}_{-0.6}$	$^{+2.0}_{-2.0}$	0.9	0.0	0.0			1.01	$^{+0}_{-2}$	1.00
408–442	$1.93 \cdot 10^{0}$	0.33	0.45	$^{+4.7}_{-4.4}$	$^{+0.8}_{-0.7}$	$^{+0.5}_{-0.4}$	$^{+1.8}_{-1.7}$	0.9	0.0	0.0			1.01	$^{+0}_{-2}$	1.00
442–478	$1.13 \cdot 10^{0}$	0.33	0.38	$^{+4.6}_{-4.5}$	$^{+0.5}_{-0.3}$	$^{+0.3}_{-0.3}$	$^{+1.5}_{-1.5}$	0.9	0.0	0.0	0.25	1.8	1.01	$^{+0}_{-2}$	1.00
478–516	$6.77 \cdot 10^{-1}$	0.27	0.26	$^{+4.7}_{-4.7}$	$^{+0.2}_{-0.1}$	$^{+0.1}_{-0.1}$	$^{+1.3}_{-1.3}$	0.8	0.0	0.0			1.01	$^{+0}_{-2}$	1.00
516–556	$4.05 \cdot 10^{-1}$	0.34	0.26	$^{+5.1}_{-5.0}$	$^{+0.1}_{-0.0}$	$^{+0.0}_{-0.0}$	$^{+1.1}_{-1.1}$	0.8	0.0	0.0			1.01	$^{+0}_{-2}$	1.01
556–598	$2.41 \cdot 10^{-1}$	0.43	0.24	$^{+5.6}_{-5.5}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.0}_{-1.0}$	0.8	0.0	0.0			1.01	$^{+0}_{-1}$	1.01
598–642	$1.43 \cdot 10^{-1}$	0.53	0.21	$^{+6.1}_{-6.0}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.8}_{-0.8}$	0.9	0.0	0.0			1.00	$^{+0}_{-1}$	1.01
642–688	$8.58 \cdot 10^{-2}$	0.69	0.22	$^{+6.7}_{-6.6}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.7}_{-0.7}$	0.9	0.1	0.0			1.00	$^{+0}_{-1}$	1.01
688–736	$5.13 \cdot 10^{-2}$	0.87	0.22	$^{+7.3}_{-7.2}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.7}_{-0.7}$	0.9	0.1	0.0			1.00	$^{+0}_{-1}$	1.01
736–786	$3.03 \cdot 10^{-2}$	1.1	0.25	$^{+8.2}_{-8.1}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.6}_{-0.6}$	0.9	0.1	0.0			1.00	$^{+0}_{-1}$	1.02
786–838	$1.79 \cdot 10^{-2}$	1.4	0.24	$^{+9.0}_{-8.8}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.6}_{-0.6}$	0.9	0.1	0.0			1.00	$^{+0}_{-1}$	1.02
838–894	$1.08 \cdot 10^{-2}$	1.7	0.26	$^{+9.9}_{-9.6}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.6}_{-0.6}$	1.0	0.1	0.0			1.00	$^{+0}_{-1}$	1.02
894–952	$6.00 \cdot 10^{-3}$	2.3	0.28	$^{+11}_{-10}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.7}_{-0.7}$	1.1	0.1	0.0			1.00	$^{+0}_{-1}$	1.03
952–1012	$3.38 \cdot 10^{-3}$	3.1	0.35	$^{+11}_{-11}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.7}_{-0.7}$	1.2	0.1	0.1			1.00	$^{+0}_{-1}$	1.03
1012–1162	$1.23 \cdot 10^{-3}$	3.7	0.26	$^{+13}_{-12}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.9}_{-0.9}$	1.3	0.1	0.1			1.00	$^{+0}_{-1}$	1.04
1162–1310	$2.86 \cdot 10^{-4}$	7.7	0.33	$^{+15}_{-14}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.0}_{-1.0}$	1.4	0.1	1.0			1.00	$^{+0}_{-1}$	1.05
1310–1992	$2.39 \cdot 10^{-5}$	14	0.34	$^{+29}_{-28}$	$^{+0.0}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.1}_{-1.1}$	2.8	0.1	4.4			1.00	$^{+0}_{-1}$	1.06

Table 10. Measured double-differential inclusive jet cross-sections for jets with $R = 0.6$ in the rapidity bin $0.5 \leq |y| < 1.0$. See caption of table 9 for details.

JHEP09(2015)141

$p_T$range [GeV]	σ [pb/GeV]	δ_{stat}^{data} %	δ_{stat}^{MC} %	$u_{in-situ}$ %	$u_{pile-up}$ %	$u_{close-by}$ %	$u_{flavour}$ %	u_{JER} %	u_{JAR} %	u_{unfold} %	$u_{qual.}$ %	u_{lumi} %	NPC	u_{NP} %	EWC
100–116	$4.20 \cdot 10^3$	0.72	0.81	$^{+7.6}_{-7.5}$	$^{+1.9}_{-1.9}$	$^{+1.4}_{-1.5}$	$^{+6.8}_{-6.5}$	7.4	0.5	0.4			1.06	$^{+1}_{-5}$	1.00
116–134	$1.95 \cdot 10^3$	0.84	0.64	$^{+7.7}_{-7.4}$	$^{+1.7}_{-1.5}$	$^{+1.3}_{-1.2}$	$^{+6.2}_{-5.9}$	5.9	0.3	0.3			1.05	$^{+1}_{-5}$	1.00
134–152	$9.37 \cdot 10^2$	0.86	0.46	$^{+7.5}_{-7.2}$	$^{+1.5}_{-1.3}$	$^{+1.1}_{-1.0}$	$^{+5.6}_{-5.3}$	4.6	0.3	0.0			1.04	$^{+1}_{-4}$	1.00
152–172	$4.64 \cdot 10^2$	0.68	0.39	$^{+7.4}_{-7.1}$	$^{+1.3}_{-1.2}$	$^{+1.0}_{-0.9}$	$^{+5.1}_{-4.8}$	3.8	0.2	0.0			1.03	$^{+1}_{-4}$	1.00
172–194	$2.32 \cdot 10^2$	0.56	0.40	$^{+7.4}_{-7.0}$	$^{+1.3}_{-1.2}$	$^{+0.9}_{-0.8}$	$^{+4.6}_{-4.4}$	3.3	0.2	0.0			1.03	$^{+1}_{-3}$	1.00
194–216	$1.20 \cdot 10^2$	0.71	0.44	$^{+7.3}_{-7.0}$	$^{+1.1}_{-1.1}$	$^{+1.0}_{-0.9}$	$^{+4.2}_{-4.0}$	2.9	0.2	0.0			1.02	$^{+1}_{-3}$	1.00
216–240	$6.36 \cdot 10^1$	0.55	0.44	$^{+7.0}_{-7.0}$	$^{+1.0}_{-1.0}$	$^{+1.0}_{-1.1}$	$^{+3.8}_{-3.7}$	2.6	0.1	0.0			1.02	$^{+1}_{-3}$	1.00
240–264	$3.51 \cdot 10^1$	0.70	0.42	$^{+6.9}_{-6.7}$	$^{+1.0}_{-0.9}$	$^{+1.1}_{-1.1}$	$^{+3.5}_{-3.4}$	2.5	0.1	0.0			1.02	$^{+1}_{-3}$	1.00
264–290	$1.98 \cdot 10^1$	0.93	0.40	$^{+6.7}_{-6.3}$	$^{+1.0}_{-0.9}$	$^{+1.1}_{-1.1}$	$^{+3.2}_{-3.1}$	2.4	0.2	0.0			1.02	$^{+1}_{-2}$	1.00
290–318	$1.12 \cdot 10^1$	1.2	0.52	$^{+6.5}_{-6.1}$	$^{+1.0}_{-0.9}$	$^{+1.1}_{-1.1}$	$^{+2.9}_{-2.8}$	2.4	0.1	0.0			1.02	$^{+1}_{-2}$	1.00
318–346	$6.37 \cdot 10^0$	1.1	0.57	$^{+6.4}_{-6.1}$	$^{+1.1}_{-1.0}$	$^{+1.0}_{-1.0}$	$^{+2.6}_{-2.5}$	2.3	0.1	0.0			1.01	$^{+1}_{-2}$	1.00
346–376	$3.71 \cdot 10^0$	0.59	0.65	$^{+6.3}_{-5.9}$	$^{+1.2}_{-1.1}$	$^{+0.9}_{-0.9}$	$^{+2.3}_{-2.2}$	2.2	0.1	0.0			1.01	$^{+1}_{-2}$	1.00
376–408	$2.15 \cdot 10^0$	0.35	0.52	$^{+6.1}_{-5.9}$	$^{+1.2}_{-1.0}$	$^{+0.7}_{-0.7}$	$^{+2.0}_{-1.9}$	2.2	0.1	0.0	0.25	1.8	1.01	$^{+0}_{-2}$	1.00
408–442	$1.23 \cdot 10^0$	0.39	0.50	$^{+5.8}_{-5.8}$	$^{+0.9}_{-0.8}$	$^{+0.5}_{-0.5}$	$^{+1.8}_{-1.7}$	2.1	0.1	0.0			1.01	$^{+0}_{-2}$	1.00
442–478	$7.13 \cdot 10^{-1}$	0.41	0.40	$^{+6.0}_{-5.7}$	$^{+0.5}_{-0.4}$	$^{+0.3}_{-0.3}$	$^{+1.6}_{-1.5}$	2.2	0.1	0.0			1.01	$^{+0}_{-2}$	1.00
478–516	$4.06 \cdot 10^{-1}$	0.35	0.32	$^{+6.2}_{-5.8}$	$^{+0.2}_{-0.1}$	$^{+0.1}_{-0.1}$	$^{+1.5}_{-1.4}$	2.2	0.1	0.0			1.01	$^{+0}_{-2}$	1.00
516–556	$2.29 \cdot 10^{-1}$	0.44	0.30	$^{+6.6}_{-6.2}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.4}_{-1.3}$	2.3	0.1	0.0			1.01	$^{+0}_{-2}$	1.00
556–598	$1.29 \cdot 10^{-1}$	0.58	0.32	$^{+7.0}_{-6.6}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.2}_{-1.2}$	2.4	0.1	0.0			1.01	$^{+0}_{-2}$	1.00
598–642	$7.17 \cdot 10^{-2}$	0.75	0.28	$^{+7.6}_{-7.4}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.1}_{-1.1}$	2.4	0.1	0.0			1.01	$^{+0}_{-2}$	1.00
642–688	$3.90 \cdot 10^{-2}$	0.98	0.26	$^{+8.3}_{-8.2}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.0}_{-1.0}$	2.5	0.1	0.0			1.01	$^{+0}_{-2}$	1.00
688–736	$2.13 \cdot 10^{-2}$	1.3	0.28	$^{+9.3}_{-9.1}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.0}_{-1.0}$	2.6	0.1	0.0			1.01	$^{+0}_{-2}$	1.00
736–786	$1.17 \cdot 10^{-2}$	1.7	0.30	$^{+10}_{-10}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.9}_{-1.0}$	2.8	0.1	0.1			1.01	$^{+0}_{-2}$	1.00
786–838	$5.96 \cdot 10^{-3}$	2.3	0.34	$^{+11}_{-11}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+0.9}_{-1.0}$	3.0	0.1	0.1			1.01	$^{+0}_{-2}$	1.00
838–894	$3.05 \cdot 10^{-3}$	3.2	0.45	$^{+12}_{-12}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.0}_{-1.0}$	3.1	0.1	0.9			1.01	$^{+0}_{-2}$	1.01
894–1012	$1.06 \cdot 10^{-3}$	4.3	0.33	$^{+14}_{-13}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.0}_{-1.0}$	3.4	0.1	2.4			1.01	$^{+0}_{-2}$	1.01
1012–1992	$3.59 \cdot 10^{-5}$	8.8	0.50	$^{+19}_{-18}$	$^{+0.1}_{-0.2}$	$^{+0.0}_{-0.0}$	$^{+1.5}_{-1.7}$	4.4	0.1	2.0			1.01	$^{+0}_{-2}$	1.01

Table 11. Measured double-differential inclusive jet cross-sections for jets with $R = 0.6$ in the rapidity bin $1.0 \leq |y| < 1.5$. See caption of table 9 for details.

$p_T$range	σ	δ_{stat}^{data}	δ_{stat}^{MC}	$u_{in\text{-}situ}$	$u_{pile\text{-}up}$	$u_{close\text{-}by}$	$u_{flavour}$	u_{JER}	u_{JAR}	u_{unfold}	$u_{qual.}$	u_{lumi}	NPC	u_{NP}	EWC
[GeV]	[pb/GeV]	%	%	%	%	%	%	%	%	%	%	%		%	
100–116	$3.25 \cdot 10^{3}$	0.63	0.99	$^{+11}_{-10}$	$^{+2.0}_{-2.0}$	$^{+1.6}_{-1.4}$	$^{+6.9}_{-6.6}$	9.1	1.0	0.4			1.05	$^{+1}_{-5}$	1.00
116–134	$1.47 \cdot 10^{3}$	0.87	0.66	$^{+11}_{-10}$	$^{+1.8}_{-1.5}$	$^{+1.5}_{-1.2}$	$^{+6.1}_{-5.6}$	7.1	0.7	0.2			1.04	$^{+2}_{-4}$	1.00
134–152	$6.91 \cdot 10^{2}$	1.1	0.54	$^{+12}_{-10}$	$^{+1.8}_{-1.3}$	$^{+1.2}_{-1.0}$	$^{+5.6}_{-4.9}$	5.9	0.6	0.0			1.03	$^{+2}_{-4}$	1.00
152–172	$3.42 \cdot 10^{2}$	0.81	0.43	$^{+12}_{-11}$	$^{+1.6}_{-1.3}$	$^{+1.0}_{-1.0}$	$^{+5.0}_{-4.6}$	5.2	0.5	0.0			1.03	$^{+2}_{-3}$	1.00
172–194	$1.66 \cdot 10^{2}$	0.67	0.45	$^{+12}_{-11}$	$^{+1.4}_{-1.3}$	$^{+1.0}_{-1.0}$	$^{+4.4}_{-4.1}$	4.5	0.4	0.0			1.03	$^{+2}_{-3}$	1.00
194–216	$8.16 \cdot 10^{1}$	0.92	0.47	$^{+11}_{-11}$	$^{+1.3}_{-1.2}$	$^{+1.0}_{-1.0}$	$^{+3.8}_{-3.6}$	3.9	0.3	0.0			1.02	$^{+1}_{-3}$	1.00
216–240	$4.28 \cdot 10^{1}$	0.69	0.43	$^{+11}_{-10}$	$^{+1.1}_{-1.1}$	$^{+1.1}_{-1.1}$	$^{+3.4}_{-3.3}$	3.8	0.3	0.0			1.02	$^{+1}_{-2}$	1.00
240–264	$2.28 \cdot 10^{1}$	0.90	0.42	$^{+11}_{-10}$	$^{+1.1}_{-1.0}$	$^{+1.2}_{-1.1}$	$^{+3.2}_{-3.1}$	3.7	0.3	0.0			1.02	$^{+1}_{-2}$	1.00
264–290	$1.23 \cdot 10^{1}$	1.2	0.50	$^{+11}_{-9.6}$	$^{+1.1}_{-1.0}$	$^{+1.3}_{-1.1}$	$^{+3.1}_{-2.9}$	3.7	0.3	0.0			1.02	$^{+1}_{-2}$	1.00
290–318	$6.38 \cdot 10^{0}$	1.6	0.52	$^{+10}_{-9.3}$	$^{+1.2}_{-1.1}$	$^{+1.2}_{-1.1}$	$^{+2.9}_{-2.7}$	3.6	0.3	0.1			1.02	$^{+1}_{-2}$	1.00
318–346	$3.48 \cdot 10^{0}$	1.6	0.66	$^{+9.9}_{-9.3}$	$^{+1.2}_{-1.2}$	$^{+1.1}_{-1.0}$	$^{+2.6}_{-2.6}$	3.7	0.3	0.0			1.02	$^{+1}_{-2}$	1.00
346–376	$1.93 \cdot 10^{0}$	0.84	0.78	$^{+9.7}_{-9.5}$	$^{+1.3}_{-1.2}$	$^{+0.9}_{-0.9}$	$^{+2.3}_{-2.4}$	3.9	0.3	0.0	0.25	1.8	1.02	$^{+0}_{-2}$	1.00
376–408	$1.02 \cdot 10^{0}$	0.50	0.80	$^{+9.7}_{-9.1}$	$^{+1.3}_{-1.2}$	$^{+0.7}_{-0.8}$	$^{+2.2}_{-2.2}$	4.0	0.3	0.0			1.02	$^{+0}_{-2}$	0.99
408–442	$5.31 \cdot 10^{-1}$	0.63	0.67	$^{+9.7}_{-8.8}$	$^{+1.1}_{-1.0}$	$^{+0.5}_{-0.5}$	$^{+2.1}_{-2.0}$	4.0	0.3	0.0			1.02	$^{+0}_{-2}$	0.99
442–478	$2.74 \cdot 10^{-1}$	0.69	0.59	$^{+10}_{-8.9}$	$^{+0.7}_{-0.6}$	$^{+0.3}_{-0.3}$	$^{+2.0}_{-1.9}$	4.2	0.3	0.0			1.02	$^{+0}_{-2}$	0.99
478–516	$1.37 \cdot 10^{-1}$	0.60	0.52	$^{+10}_{-9.3}$	$^{+0.3}_{-0.2}$	$^{+0.1}_{-0.1}$	$^{+1.9}_{-1.8}$	4.5	0.3	0.0			1.02	$^{+0}_{-2}$	0.99
516–556	$6.73 \cdot 10^{-2}$	0.81	0.58	$^{+11}_{-9.7}$	$^{+0.1}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.8}_{-1.7}$	5.0	0.3	0.1			1.02	$^{+0}_{-2}$	0.99
556–598	$3.17 \cdot 10^{-2}$	1.2	0.57	$^{+11}_{-11}$	$^{+0.2}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.7}_{-1.7}$	5.5	0.3	0.1			1.02	$^{+0}_{-2}$	0.99
598–642	$1.44 \cdot 10^{-2}$	1.6	0.52	$^{+12}_{-12}$	$^{+0.2}_{-0.2}$	$^{+0.0}_{-0.0}$	$^{+1.6}_{-1.6}$	6.1	0.3	0.1			1.02	$^{+0}_{-2}$	0.99
642–688	$6.47 \cdot 10^{-3}$	2.5	0.64	$^{+13}_{-13}$	$^{+0.1}_{-0.2}$	$^{+0.0}_{-0.0}$	$^{+1.5}_{-1.6}$	6.8	0.3	0.1			1.02	$^{+0}_{-2}$	0.99
688–736	$2.66 \cdot 10^{-3}$	3.6	0.61	$^{+14}_{-14}$	$^{+0.1}_{-0.2}$	$^{+0.0}_{-0.0}$	$^{+1.4}_{-1.5}$	7.4	0.3	1.3			1.02	$^{+0}_{-2}$	0.99
736–894	$5.36 \cdot 10^{-4}$	5.3	0.55	$^{+16}_{-16}$	$^{+0.0}_{-0.1}$	$^{+0.0}_{-0.0}$	$^{+1.2}_{-1.2}$	8.5	0.3	2.7			1.02	$^{+0}_{-2}$	0.99
894–1992	$2.70 \cdot 10^{-6}$	27	2.9	$^{+30}_{-27}$	$^{+0.0}_{-0.5}$	$^{+0.0}_{-0.0}$	$^{+1.3}_{-1.4}$	15	0.6	4.3			1.02	$^{+0}_{-2}$	0.99

Table 12. Measured double-differential inclusive jet cross-sections for jets with $R = 0.6$ in the rapidity bin $1.5 \leq |y| < 2.0$. See caption of table 9 for details.

JHEP09(2015)141

p_T range	σ	δ_{stat}^{data}	δ_{stat}^{MC}	$u_{in\text{-}situ}$	$u_{pile\text{-}up}$	$u_{close\text{-}by}$	$u_{flavour}$	u_{JER}	u_{JAR}	u_{unfold}	$u_{qual.}$	u_{lumi}	NPC	u_{NP}	EWC
[GeV]	[pb/GeV]	%	%	%	%	%	%	%	%	%	%	%		%	
100–116	$2.26 \cdot 10^{3}$	0.86	1.0	$^{+15}_{-14}$	$^{+2.0}_{-2.3}$	$^{+1.6}_{-1.3}$	$^{+4.8}_{-4.5}$	12	1.5	0.4			1.05	$^{+2}_{-4}$	1.00
116–134	$9.78 \cdot 10^{2}$	1.1	0.97	$^{+15}_{-14}$	$^{+2.0}_{-1.9}$	$^{+1.2}_{-1.1}$	$^{+4.2}_{-3.9}$	9.7	1.1	0.1			1.04	$^{+2}_{-3}$	1.00
134–152	$4.45 \cdot 10^{2}$	1.4	0.82	$^{+15}_{-14}$	$^{+1.8}_{-1.6}$	$^{+1.0}_{-1.0}$	$^{+3.8}_{-3.5}$	7.6	0.9	0.0			1.03	$^{+2}_{-3}$	1.00
152–172	$1.98 \cdot 10^{2}$	1.1	1.1	$^{+15}_{-15}$	$^{+1.6}_{-1.5}$	$^{+1.0}_{-1.0}$	$^{+3.4}_{-3.3}$	6.4	0.8	0.0			1.03	$^{+2}_{-3}$	1.00
172–194	$9.36 \cdot 10^{1}$	0.92	0.51	$^{+16}_{-15}$	$^{+1.6}_{-1.5}$	$^{+1.0}_{-0.9}$	$^{+3.2}_{-3.1}$	5.9	0.8	0.0			1.03	$^{+2}_{-2}$	1.00
194–216	$4.22 \cdot 10^{1}$	1.3	0.55	$^{+17}_{-15}$	$^{+1.6}_{-1.4}$	$^{+1.0}_{-1.0}$	$^{+3.0}_{-2.9}$	5.4	0.7	0.1			1.02	$^{+2}_{-2}$	1.00
216–240	$2.00 \cdot 10^{1}$	1.0	0.77	$^{+17}_{-16}$	$^{+1.5}_{-1.4}$	$^{+1.1}_{-1.1}$	$^{+2.8}_{-2.8}$	5.2	0.7	0.0			1.02	$^{+1}_{-2}$	1.00
240–264	$9.67 \cdot 10^{0}$	1.5	0.59	$^{+18}_{-16}$	$^{+1.3}_{-1.3}$	$^{+1.2}_{-1.2}$	$^{+2.7}_{-2.6}$	5.2	0.7	0.0			1.02	$^{+1}_{-2}$	1.00
264–290	$4.69 \cdot 10^{0}$	2.1	0.71	$^{+18}_{-15}$	$^{+1.3}_{-1.2}$	$^{+1.3}_{-1.2}$	$^{+2.5}_{-2.5}$	5.5	0.7	0.0			1.02	$^{+1}_{-2}$	0.99
290–318	$2.14 \cdot 10^{0}$	3.0	0.76	$^{+17}_{-15}$	$^{+1.4}_{-1.3}$	$^{+1.2}_{-1.2}$	$^{+2.5}_{-2.4}$	5.8	0.8	0.1	0.25	1.8	1.02	$^{+1}_{-2}$	0.99
318–346	$9.48 \cdot 10^{-1}$	3.4	0.86	$^{+17}_{-15}$	$^{+1.6}_{-1.4}$	$^{+1.1}_{-1.0}$	$^{+2.3}_{-2.3}$	6.2	0.7	0.0			1.02	$^{+1}_{-2}$	0.99
346–376	$4.32 \cdot 10^{-1}$	1.9	1.2	$^{+17}_{-15}$	$^{+1.8}_{-1.6}$	$^{+0.9}_{-0.9}$	$^{+2.2}_{-2.2}$	6.6	0.6	0.1			1.02	$^{+1}_{-2}$	0.99
376–408	$1.83 \cdot 10^{-1}$	1.2	1.1	$^{+17}_{-16}$	$^{+1.8}_{-1.6}$	$^{+0.7}_{-0.7}$	$^{+2.1}_{-2.3}$	7.2	0.5	0.0			1.02	$^{+1}_{-2}$	0.99
408–442	$7.48 \cdot 10^{-2}$	1.8	1.6	$^{+18}_{-17}$	$^{+1.6}_{-1.3}$	$^{+0.5}_{-0.5}$	$^{+2.1}_{-2.3}$	7.8	0.4	0.0			1.02	$^{+0}_{-2}$	0.99
442–478	$2.88 \cdot 10^{-2}$	2.4	1.4	$^{+20}_{-18}$	$^{+1.1}_{-0.8}$	$^{+0.3}_{-0.3}$	$^{+2.1}_{-2.2}$	8.5	0.4	0.1			1.02	$^{+0}_{-2}$	0.99
478–516	$1.01 \cdot 10^{-2}$	2.3	1.3	$^{+22}_{-20}$	$^{+0.5}_{-0.4}$	$^{+0.2}_{-0.1}$	$^{+2.1}_{-2.1}$	9.4	0.4	0.1			1.02	$^{+0}_{-2}$	0.99
516–556	$3.29 \cdot 10^{-3}$	4.0	2.2	$^{+24}_{-22}$	$^{+0.1}_{-0.1}$	$^{+0.1}_{-0.0}$	$^{+1.9}_{-2.0}$	11	0.4	0.8			1.02	$^{+0}_{-2}$	0.99
556–642	$6.57 \cdot 10^{-4}$	6.6	2.4	$^{+27}_{-22}$	$^{+0.1}_{-0.2}$	$^{+0.0}_{-0.0}$	$^{+1.4}_{-1.8}$	13	0.4	1.2			1.02	$^{+0}_{-3}$	0.99
642–894	$1.20 \cdot 10^{-5}$	29	5.5	$^{+48}_{-38}$	$^{+0.2}_{-0.3}$	$^{+0.0}_{-0.0}$	$^{+0.2}_{-0.7}$	31	0.4	1.7			1.02	$^{+0}_{-3}$	0.98

Table 13. Measured double-differential inclusive jet cross-sections for jets with $R = 0.6$ in the rapidity bin $2.0 \leq |y| < 2.5$. See caption of table 9 for details.

p_T range	σ	δ_{stat}^{data}	δ_{stat}^{MC}	$u_{in\text{-}situ}$	$u_{pile\text{-}up}$	$u_{close\text{-}by}$	$u_{flavour}$	u_{JER}	u_{JAR}	u_{unfold}	$u_{qual.}$	u_{lumi}	NPC	u_{NP}	EWC
[GeV]	[pb/GeV]	%	%	%	%	%	%	%	%	%	%	%		%	
100–116	$1.36 \cdot 10^{3}$	1.0	1.1	$^{+21}_{-18}$	$^{+2.6}_{-1.9}$	$^{+1.4}_{-1.4}$	$^{+3.5}_{-3.0}$	13	2.6	0.1			1.04	$^{+2}_{-3}$	1.00
116–134	$5.20 \cdot 10^{2}$	1.5	1.1	$^{+22}_{-19}$	$^{+2.1}_{-2.1}$	$^{+1.3}_{-1.1}$	$^{+2.8}_{-2.9}$	10	2.3	0.1			1.03	$^{+2}_{-2}$	1.00
134–152	$2.04 \cdot 10^{2}$	2.1	0.83	$^{+22}_{-20}$	$^{+2.1}_{-2.4}$	$^{+1.1}_{-1.0}$	$^{+2.6}_{-2.9}$	9.0	2.1	0.0			1.03	$^{+2}_{-2}$	1.00
152–172	$8.20 \cdot 10^{1}$	1.7	0.83	$^{+23}_{-21}$	$^{+2.1}_{-2.6}$	$^{+1.0}_{-1.0}$	$^{+2.5}_{-2.9}$	8.4	1.9	0.0			1.03	$^{+2}_{-2}$	1.00
172–194	$3.10 \cdot 10^{1}$	1.6	0.92	$^{+25}_{-22}$	$^{+2.1}_{-2.5}$	$^{+1.0}_{-1.1}$	$^{+2.4}_{-2.8}$	8.4	2.0	0.0			1.03	$^{+2}_{-2}$	1.00
194–216	$1.14 \cdot 10^{1}$	2.5	1.1	$^{+28}_{-23}$	$^{+2.2}_{-2.2}$	$^{+1.1}_{-1.1}$	$^{+2.6}_{-2.6}$	8.9	2.3	0.1	0.25	1.8	1.03	$^{+1}_{-2}$	1.00
216–240	$4.30 \cdot 10^{0}$	2.2	1.6	$^{+31}_{-25}$	$^{+2.3}_{-2.2}$	$^{+1.2}_{-1.1}$	$^{+2.8}_{-2.6}$	9.7	2.7	0.0			1.03	$^{+1}_{-2}$	0.99
240–264	$1.50 \cdot 10^{0}$	3.5	1.6	$^{+34}_{-27}$	$^{+2.5}_{-2.2}$	$^{+1.4}_{-1.3}$	$^{+2.9}_{-2.7}$	10	2.9	0.0			1.03	$^{+1}_{-2}$	0.99
264–290	$4.86 \cdot 10^{-1}$	5.7	2.3	$^{+36}_{-28}$	$^{+2.5}_{-2.3}$	$^{+1.5}_{-1.4}$	$^{+2.7}_{-2.5}$	12	2.9	0.1			1.03	$^{+1}_{-3}$	0.99
290–318	$1.77 \cdot 10^{-1}$	9.2	2.1	$^{+38}_{-29}$	$^{+2.4}_{-2.4}$	$^{+1.6}_{-1.4}$	$^{+2.6}_{-2.4}$	13	3.0	0.0			1.03	$^{+0}_{-3}$	0.99
318–376	$2.89 \cdot 10^{-2}$	14	2.3	$^{+42}_{-30}$	$^{+2.6}_{-2.9}$	$^{+1.5}_{-1.2}$	$^{+2.9}_{-2.6}$	16	3.6	0.1			1.03	$^{+0}_{-3}$	0.99
376–478	$8.92 \cdot 10^{-4}$	9.9	6.9	$^{+55}_{-38}$	$^{+6.3}_{-5.6}$	$^{+1.4}_{-0.3}$	$^{+3.0}_{-3.4}$	29	11	0.3			1.03	$^{+0}_{-3}$	0.99

Table 14. Measured double-differential inclusive jet cross-sections for jets with $R = 0.6$ in the rapidity bin $2.5 \leq |y| < 3.0$. See caption of table 9 for details.

JHEP09(2015)141

References

[1] ATLAS collaboration, *ATLAS tunes of PYTHIA 6 and PYTHIA 8 for MC11*, ATL-PHYS-PUB-2011-009 (2011) [ATL-COM-PHYS-2011-744] [INSPIRE].

[2] P.Z. Skands, *Tuning Monte Carlo Generators: The Perugia Tunes*, Phys. Rev. **D 82** (2010) 074018 [arXiv:1005.3457] [INSPIRE].

[3] S. Gieseke, C. Rohr and A. Siodmok, *Colour reconnections in HERWIG++*, Eur. Phys. J. **C 72** (2012) 2225 [arXiv:1206.0041] [INSPIRE].

[4] R. Corke and T. Sjöstrand, *Interleaved Parton Showers and Tuning Prospects*, JHEP **03** (2011) 032 [arXiv:1011.1759] [INSPIRE].

[5] ATLAS collaboration, *Summary of ATLAS Pythia 8 tunes*, ATL-PHYS-PUB-2012-003 (2012) [ATL-COM-PHYS-2012-738] [INSPIRE].

[6] J. Pumplin, D.R. Stump, J. Huston, H.L. Lai, P.M. Nadolsky and W.K. Tung, *New generation of parton distributions with uncertainties from global QCD analysis*, JHEP **07** (2002) 012 [hep-ph/0201195] [INSPIRE].

[7] ATLAS collaboration, *Measurement of dijet cross sections in pp collisions at* 7 *TeV centre-of-mass energy using the ATLAS detector*, JHEP **05** (2014) 059 [arXiv:1312.3524] [INSPIRE].

[8] ATLAS collaboration, *Measurement of inclusive jet and dijet production in pp collisions at* $\sqrt{s} = 7$ *TeV using the ATLAS detector*, Phys. Rev. **D 86** (2012) 014022 [arXiv:1112.6297] [INSPIRE].

[9] ATLAS collaboration, *Measurement of the inclusive jet cross section in pp collisions at* $\sqrt{s} = 2.76$ *TeV and comparison to the inclusive jet cross section at* $\sqrt{s} = 7$ *TeV using the ATLAS detector*, Eur. Phys. J. **C 73** (2013) 2509 [arXiv:1304.4739] [INSPIRE].

[10] ATLAS collaboration, *Jet energy measurement and its systematic uncertainty in proton-proton collisions at* $\sqrt{s} = 7$ *TeV with the ATLAS detector*, Eur. Phys. J. **C 75** (2015) 17 [arXiv:1406.0076] [INSPIRE].

JHEP09(2015)141

The ATLAS collaboration

G. Aad[84], B. Abbott[112], J. Abdallah[152], S. Abdel Khalek[116], O. Abdinov[11], R. Aben[106], B. Abi[113], M. Abolins[89], O.S. AbouZeid[159], H. Abramowicz[154], H. Abreu[153], R. Abreu[30], Y. Abulaiti[147a,147b], B.S. Acharya[165a,165b,a], L. Adamczyk[38a], D.L. Adams[25], J. Adelman[177], S. Adomeit[99], T. Adye[130], T. Agatonovic-Jovin[13a], J.A. Aguilar-Saavedra[125a,125f], M. Agustoni[17], S.P. Ahlen[22], F. Ahmadov[64,b], G. Aielli[134a,134b], H. Akerstedt[147a,147b], T.P.A. Åkesson[80], G. Akimoto[156], A.V. Akimov[95], G.L. Alberghi[20a,20b], J. Albert[170], S. Albrand[55], M.J. Alconada Verzini[70], M. Aleksa[30], I.N. Aleksandrov[64], C. Alexa[26a], G. Alexander[154], G. Alexandre[49], T. Alexopoulos[10], M. Alhroob[165a,165c], G. Alimonti[90a], L. Alio[84], J. Alison[31], B.M.M. Allbrooke[18], L.J. Allison[71], P.P. Allport[73], J. Almond[83], A. Aloisio[103a,103b], A. Alonso[36], F. Alonso[70], C. Alpigiani[75], A. Altheimer[35], B. Alvarez Gonzalez[89], M.G. Alviggi[103a,103b], K. Amako[65], Y. Amaral Coutinho[24a], C. Amelung[23], D. Amidei[88], S.P. Amor Dos Santos[125a,125c], A. Amorim[125a,125b], S. Amoroso[48], N. Amram[154], G. Amundsen[23], C. Anastopoulos[140], L.S. Ancu[49], N. Andari[30], T. Andeen[35], C.F. Anders[58b], G. Anders[30], K.J. Anderson[31], A. Andreazza[90a,90b], V. Andrei[58a], X.S. Anduaga[70], S. Angelidakis[9], I. Angelozzi[106], P. Anger[44], A. Angerami[35], F. Anghinolfi[30], A.V. Anisenkov[108], N. Anjos[125a], A. Annovi[47], A. Antonaki[9], M. Antonelli[47], A. Antonov[97], J. Antos[145b], F. Anulli[133a], M. Aoki[65], L. Aperio Bella[18], R. Apolle[119,c], G. Arabidze[89], I. Aracena[144], Y. Arai[65], J.P. Araque[125a], A.T.H. Arce[45], J-F. Arguin[94], S. Argyropoulos[42], M. Arik[19a], A.J. Armbruster[30], O. Arnaez[30], V. Arnal[81], H. Arnold[48], M. Arratia[28], O. Arslan[21], A. Artamonov[96], G. Artoni[23], S. Asai[156], N. Asbah[42], A. Ashkenazi[154], B. Åsman[147a,147b], L. Asquith[6], K. Assamagan[25], R. Astalos[145a], M. Atkinson[166], N.B. Atlay[142], B. Auerbach[6], K. Augsten[127], M. Aurousseau[146b], G. Avolio[30], G. Azuelos[94,d], Y. Azuma[156], M.A. Baak[30], A. Baas[58a], C. Bacci[135a,135b], H. Bachacou[137], K. Bachas[155], M. Backes[30], M. Backhaus[30], J. Backus Mayes[144], E. Badescu[26a], P. Bagiacchi[133a,133b], P. Bagnaia[133a,133b], Y. Bai[33a], T. Bain[35], J.T. Baines[130], O.K. Baker[177], P. Balek[128], F. Balli[137], E. Banas[39], Sw. Banerjee[174], A.A.E. Bannoura[176], V. Bansal[170], H.S. Bansil[18], L. Barak[173], S.P. Baranov[95], E.L. Barberio[87], D. Barberis[50a,50b], M. Barbero[84], T. Barillari[100], M. Barisonzi[176], T. Barklow[144], N. Barlow[28], B.M. Barnett[130], R.M. Barnett[15], Z. Barnovska[5], A. Baroncelli[135a], G. Barone[49], A.J. Barr[119], F. Barreiro[81], J. Barreiro Guimarães da Costa[57], R. Bartoldus[144], A.E. Barton[71], P. Bartos[145a], V. Bartsch[150], A. Bassalat[116], A. Basye[166], R.L. Bates[53], J.R. Batley[28], M. Battaglia[138], M. Battistin[30], F. Bauer[137], H.S. Bawa[144,e], M.D. Beattie[71], T. Beau[79], P.H. Beauchemin[162], R. Beccherle[123a,123b], P. Bechtle[21], H.P. Beck[17], K. Becker[176], S. Becker[99], M. Beckingham[171], C. Becot[116], A.J. Beddall[19c], A. Beddall[19c], S. Bedikian[177], V.A. Bednyakov[64], C.P. Bee[149], L.J. Beemster[106], T.A. Beermann[176], M. Begel[25], K. Behr[119], C. Belanger-Champagne[86], P.J. Bell[49], W.H. Bell[49], G. Bella[154], L. Bellagamba[20a], A. Bellerive[29], M. Bellomo[85], K. Belotskiy[97], O. Beltramello[30], O. Benary[154], D. Benchekroun[136a], K. Bendtz[147a,147b], N. Benekos[166], Y. Benhammou[154], E. Benhar Noccioli[49], J.A. Benitez Garcia[160b], D.P. Benjamin[45], J.R. Bensinger[23], K. Benslama[131], S. Bentvelsen[106], D. Berge[106], E. Bergeaas Kuutmann[16], N. Berger[5], F. Berghaus[170], J. Beringer[15], C. Bernard[22], P. Bernat[77], C. Bernius[78], F.U. Bernlochner[170], T. Berry[76], P. Berta[128], C. Bertella[84], G. Bertoli[147a,147b], F. Bertolucci[123a,123b], C. Bertsche[112], D. Bertsche[112], M.I. Besana[90a], G.J. Besjes[105], O. Bessidskaia Bylund[147a,147b], M. Bessner[42], N. Besson[137], C. Betancourt[48], S. Bethke[100], W. Bhimji[46], R.M. Bianchi[124], L. Bianchini[23], M. Bianco[30], O. Biebel[99], S.P. Bieniek[77], K. Bierwagen[54], J. Biesiada[15], M. Biglietti[135a], J. Bilbao De Mendizabal[49], H. Bilokon[47], M. Bindi[54], S. Binet[116], A. Bingul[19c], C. Bini[133a,133b], C.W. Black[151], J.E. Black[144], K.M. Black[22], D. Blackburn[139], R.E. Blair[6], J.-B. Blanchard[137], T. Blazek[145a], I. Bloch[42], C. Blocker[23], W. Blum[82,*], U. Blumenschein[54], G.J. Bobbink[106], V.S. Bobrovnikov[108],

JHEP09(2015)141

S.S. Bocchetta[80], A. Bocci[45], C. Bock[99], C.R. Boddy[119], M. Boehler[48], T.T. Boek[176], J.A. Bogaerts[30], A.G. Bogdanchikov[108], A. Bogouch[91,*], C. Bohm[147a], J. Bohm[126], V. Boisvert[76], T. Bold[38a], V. Boldea[26a], A.S. Boldyrev[98], M. Bomben[79], M. Bona[75], M. Boonekamp[137], A. Borisov[129], G. Borissov[71], M. Borri[83], S. Borroni[42], J. Bortfeldt[99], V. Bortolotto[135a,135b], K. Bos[106], D. Boscherini[20a], M. Bosman[12], H. Boterenbrood[106], J. Boudreau[124], J. Bouffard[2], E.V. Bouhova-Thacker[71], D. Boumediene[34], C. Bourdarios[116], N. Bousson[113], S. Boutouil[136d], A. Boveia[31], J. Boyd[30], I.R. Boyko[64], J. Bracinik[18], A. Brandt[8], G. Brandt[15], O. Brandt[58a], U. Bratzler[157], B. Brau[85], J.E. Brau[115], H.M. Braun[176,*], S.F. Brazzale[165a,165c], B. Brelier[159], K. Brendlinger[121], A.J. Brennan[87], R. Brenner[167], S. Bressler[173], K. Bristow[146c], T.M. Bristow[46], D. Britton[53], F.M. Brochu[28], I. Brock[21], R. Brock[89], C. Bromberg[89], J. Bronner[100], G. Brooijmans[35], T. Brooks[76], W.K. Brooks[32b], J. Brosamer[15], E. Brost[115], J. Brown[55], P.A. Bruckman de Renstrom[39], D. Bruncko[145b], R. Bruneliere[48], S. Brunet[60], A. Bruni[20a], G. Bruni[20a], M. Bruschi[20a], L. Bryngemark[80], T. Buanes[14], Q. Buat[143], F. Bucci[49], P. Buchholz[142], R.M. Buckingham[119], A.G. Buckley[53], S.I. Buda[26a], I.A. Budagov[64], F. Buehrer[48], L. Bugge[118], M.K. Bugge[118], O. Bulekov[97], A.C. Bundock[73], H. Burckhart[30], S. Burdin[73], B. Burghgrave[107], S. Burke[130], I. Burmeister[43], E. Busato[34], D. Büscher[48], V. Büscher[82], P. Bussey[53], C.P. Buszello[167], B. Butler[57], J.M. Butler[22], A.I. Butt[3], C.M. Buttar[53], J.M. Butterworth[77], P. Butti[106], W. Buttinger[28], A. Buzatu[53], M. Byszewski[10], S. Cabrera Urbán[168], D. Caforio[20a,20b], O. Cakir[4a], P. Calafiura[15], A. Calandri[137], G. Calderini[79], P. Calfayan[99], R. Calkins[107], L.P. Caloba[24a], D. Calvet[34], S. Calvet[34], R. Camacho Toro[49], S. Camarda[42], D. Cameron[118], L.M. Caminada[15], R. Caminal Armadans[12], S. Campana[30], M. Campanelli[77], A. Campoverde[149], V. Canale[103a,103b], A. Canepa[160a], M. Cano Bret[75], J. Cantero[81], R. Cantrill[125a], T. Cao[40], M.D.M. Capeans Garrido[30], I. Caprini[26a], M. Caprini[26a], M. Capua[37a,37b], R. Caputo[82], R. Cardarelli[134a], T. Carli[30], G. Carlino[103a], L. Carminati[90a,90b], S. Caron[105], E. Carquin[32a], G.D. Carrillo-Montoya[146c], J.R. Carter[28], J. Carvalho[125a,125c], D. Casadei[77], M.P. Casado[12], M. Casolino[12], E. Castaneda-Miranda[146b], A. Castelli[106], V. Castillo Gimenez[168], N.F. Castro[125a], P. Catastini[57], A. Catinaccio[30], J.R. Catmore[118], A. Cattai[30], G. Cattani[134a,134b], V. Cavaliere[166], D. Cavalli[90a], M. Cavalli-Sforza[12], V. Cavasinni[123a,123b], F. Ceradini[135a,135b], B. Cerio[45], K. Cerny[128], A.S. Cerqueira[24b], A. Cerri[150], L. Cerrito[75], F. Cerutti[15], M. Cerv[30], A. Cervelli[17], S.A. Cetin[19b], A. Chafaq[136a], D. Chakraborty[107], I. Chalupkova[128], P. Chang[166], B. Chapleau[86], J.D. Chapman[28], D. Charfeddine[116], D.G. Charlton[18], C.C. Chau[159], C.A. Chavez Barajas[150], S. Cheatham[86], A. Chegwidden[89], S. Chekanov[6], S.V. Chekulaev[160a], G.A. Chelkov[64,f], M.A. Chelstowska[88], C. Chen[63], H. Chen[25], K. Chen[149], L. Chen[33d,g], S. Chen[33c], X. Chen[146c], Y. Chen[66], Y. Chen[35], H.C. Cheng[88], Y. Cheng[31], A. Cheplakov[64], R. Cherkaoui El Moursli[136e], V. Chernyatin[25,*], E. Cheu[7], L. Chevalier[137], V. Chiarella[47], G. Chiefari[103a,103b], J.T. Childers[6], A. Chilingarov[71], G. Chiodini[72a], A.S. Chisholm[18], R.T. Chislett[77], A. Chitan[26a], M.V. Chizhov[64], S. Chouridou[9], B.K.B. Chow[99], D. Chromek-Burckhart[30], M.L. Chu[152], J. Chudoba[126], J.J. Chwastowski[39], L. Chytka[114], G. Ciapetti[133a,133b], A.K. Ciftci[4a], R. Ciftci[4a], D. Cinca[53], V. Cindro[74], A. Ciocio[15], P. Cirkovic[13b], Z.H. Citron[173], M. Citterio[90a], M. Ciubancan[26a], A. Clark[49], P.J. Clark[46], R.N. Clarke[15], W. Cleland[124], J.C. Clemens[84], C. Clement[147a,147b], Y. Coadou[84], M. Cobal[165a,165c], A. Coccaro[139], J. Cochran[63], L. Coffey[23], J.G. Cogan[144], J. Coggeshall[166], B. Cole[35], S. Cole[107], A.P. Colijn[106], J. Collot[55], T. Colombo[58c], G. Colon[85], G. Compostella[100], P. Conde Muiño[125a,125b], E. Coniavitis[48], M.C. Conidi[12], S.H. Connell[146b], I.A. Connelly[76], S.M. Consonni[90a,90b], V. Consorti[48], S. Constantinescu[26a], C. Conta[120a,120b], G. Conti[57], F. Conventi[103a,h], M. Cooke[15], B.D. Cooper[77], A.M. Cooper-Sarkar[119], N.J. Cooper-Smith[76], K. Copic[15], T. Cornelissen[176], M. Corradi[20a], F. Corriveau[86,i], A. Corso-Radu[164], A. Cortes-Gonzalez[12], G. Cortiana[100], G. Costa[90a], M.J. Costa[168], D. Costanzo[140], D. Côté[8], G. Cottin[28], G. Cowan[76], B.E. Cox[83], K. Cranmer[109], G. Cree[29], S. Crépé-Renaudin[55], F. Crescioli[79], W.A. Cribbs[147a,147b], M. Crispin Ortuzar[119], M. Cristinziani[21], V. Croft[105],

JHEP09(2015)141

G. Crosetti[37a,37b], C.-M. Cuciuc[26a], T. Cuhadar Donszelmann[140], J. Cummings[177],
M. Curatolo[47], C. Cuthbert[151], H. Czirr[142], P. Czodrowski[3], Z. Czyczula[177], S. D'Auria[53],
M. D'Onofrio[73], M.J. Da Cunha Sargedas De Sousa[125a,125b], C. Da Via[83], W. Dabrowski[38a],
A. Dafinca[119], T. Dai[88], O. Dale[14], F. Dallaire[94], C. Dallapiccola[85], M. Dam[36], A.C. Daniells[18],
M. Dano Hoffmann[137], V. Dao[48], G. Darbo[50a], S. Darmora[8], J.A. Dassoulas[42], A. Dattagupta[60],
W. Davey[21], C. David[170], T. Davidek[128], E. Davies[119,c], M. Davies[154], O. Davignon[79],
A.R. Davison[77], P. Davison[77], Y. Davygora[58a], E. Dawe[143], I. Dawson[140],
R.K. Daya-Ishmukhametova[85], K. De[8], R. de Asmundis[103a], S. De Castro[20a,20b], S. De Cecco[79],
N. De Groot[105], P. de Jong[106], H. De la Torre[81], F. De Lorenzi[63], L. De Nooij[106], D. De Pedis[133a],
A. De Salvo[133a], U. De Sanctis[150], A. De Santo[150], J.B. De Vivie De Regie[116], W.J. Dearnaley[71],
R. Debbe[25], C. Debenedetti[138], B. Dechenaux[55], D.V. Dedovich[64], I. Deigaard[106], J. Del Peso[81],
T. Del Prete[123a,123b], F. Deliot[137], C.M. Delitzsch[49], M. Deliyergiyev[74], A. Dell'Acqua[30],
L. Dell'Asta[22], M. Dell'Orso[123a,123b], M. Della Pietra[103a,h], D. della Volpe[49], M. Delmastro[5],
P.A. Delsart[55], C. Deluca[106], S. Demers[177], M. Demichev[64], A. Demilly[79], S.P. Denisov[129],
D. Derendarz[39], J.E. Derkaoui[136d], F. Derue[79], P. Dervan[73], K. Desch[21], C. Deterre[42],
P.O. Deviveiros[106], A. Dewhurst[130], S. Dhaliwal[106], A. Di Ciaccio[134a,134b], L. Di Ciaccio[5],
A. Di Domenico[133a,133b], C. Di Donato[103a,103b], A. Di Girolamo[30], B. Di Girolamo[30],
A. Di Mattia[153], B. Di Micco[135a,135b], R. Di Nardo[47], A. Di Simone[48], R. Di Sipio[20a,20b],
D. Di Valentino[29], F.A. Dias[46], M.A. Diaz[32a], E.B. Diehl[88], J. Dietrich[42], T.A. Dietzsch[58a],
S. Diglio[84], A. Dimitrievska[13a], J. Dingfelder[21], C. Dionisi[133a,133b], P. Dita[26a], S. Dita[26a],
F. Dittus[30], F. Djama[84], T. Djobava[51b], M.A.B. do Vale[24c], A. Do Valle Wemans[125a,125g],
D. Dobos[30], C. Doglioni[49], T. Doherty[53], T. Dohmae[156], J. Dolejsi[128], Z. Dolezal[128],
B.A. Dolgoshein[97,*], M. Donadelli[24d], S. Donati[123a,123b], P. Dondero[120a,120b], J. Donini[34],
J. Dopke[130], A. Doria[103a], M.T. Dova[70], A.T. Doyle[53], M. Dris[10], J. Dubbert[88], S. Dube[15],
E. Dubreuil[34], E. Duchovni[173], G. Duckeck[99], O.A. Ducu[26a], D. Duda[176], A. Dudarev[30],
F. Dudziak[63], L. Duflot[116], L. Duguid[76], M. Dührssen[30], M. Dunford[58a], H. Duran Yildiz[4a],
M. Düren[52], A. Durglishvili[51b], M. Dwuznik[38a], M. Dyndal[38a], J. Ebke[99], W. Edson[2],
N.C. Edwards[46], W. Ehrenfeld[21], T. Eifert[144], G. Eigen[14], K. Einsweiler[15], T. Ekelof[167],
M. El Kacimi[136c], M. Ellert[167], S. Elles[5], F. Ellinghaus[82], N. Ellis[30], J. Elmsheuser[99], M. Elsing[30],
D. Emeliyanov[130], Y. Enari[156], O.C. Endner[82], M. Endo[117], R. Engelmann[149], J. Erdmann[177],
A. Ereditato[17], D. Eriksson[147a], G. Ernis[176], J. Ernst[2], M. Ernst[25], J. Ernwein[137], D. Errede[166],
S. Errede[166], E. Ertel[82], M. Escalier[116], H. Esch[43], C. Escobar[124], B. Esposito[47], A.I. Etienvre[137],
E. Etzion[154], H. Evans[60], A. Ezhilov[122], L. Fabbri[20a,20b], G. Facini[31], R.M. Fakhrutdinov[129],
S. Falciano[133a], R.J. Falla[77], J. Faltova[128], Y. Fang[33a], M. Fanti[90a,90b], A. Farbin[8], A. Farilla[135a],
T. Farooque[12], S. Farrell[15], S.M. Farrington[171], P. Farthouat[30], F. Fassi[136e], P. Fassnacht[30],
D. Fassouliotis[9], A. Favareto[50a,50b], L. Fayard[116], P. Federic[145a], O.L. Fedin[122,j], W. Fedorko[169],
M. Fehling-Kaschek[48], S. Feigl[30], L. Feligioni[84], C. Feng[33d], E.J. Feng[6], H. Feng[88],
A.B. Fenyuk[129], S. Fernandez Perez[30], S. Ferrag[53], J. Ferrando[53], A. Ferrari[167], P. Ferrari[106],
R. Ferrari[120a], D.E. Ferreira de Lima[53], A. Ferrer[168], D. Ferrere[49], C. Ferretti[88],
A. Ferretto Parodi[50a,50b], M. Fiascaris[31], F. Fiedler[82], A. Filipčič[74], M. Filipuzzi[42], F. Filthaut[105],
M. Fincke-Keeler[170], K.D. Finelli[151], M.C.N. Fiolhais[125a,125c], L. Fiorini[168], A. Firan[40],
A. Fischer[2], J. Fischer[176], W.C. Fisher[89], E.A. Fitzgerald[23], M. Flechl[48], I. Fleck[142],
P. Fleischmann[88], S. Fleischmann[176], G.T. Fletcher[140], G. Fletcher[75], T. Flick[176], A. Floderus[80],
L.R. Flores Castillo[174,k], A.C. Florez Bustos[160b], M.J. Flowerdew[100], A. Formica[137], A. Forti[83],
D. Fortin[160a], D. Fournier[116], H. Fox[71], S. Fracchia[12], P. Francavilla[79], M. Franchini[20a,20b],
S. Franchino[30], D. Francis[30], L. Franconi[118], M. Franklin[57], S. Franz[61], M. Fraternali[120a,120b],
S.T. French[28], C. Friedrich[42], F. Friedrich[44], D. Froidevaux[30], J.A. Frost[28], C. Fukunaga[157],
E. Fullana Torregrosa[82], B.G. Fulsom[144], J. Fuster[168], C. Gabaldon[55], O. Gabizon[173],
A. Gabrielli[20a,20b], A. Gabrielli[133a,133b], S. Gadatsch[106], S. Gadomski[49], G. Gagliardi[50a,50b],

JHEP09(2015)141

P. Gagnon[60], C. Galea[105], B. Galhardo[125a,125c], E.J. Gallas[119], V. Gallo[17], B.J. Gallop[130], P. Gallus[127], G. Galster[36], K.K. Gan[110], J. Gao[33b,g], Y.S. Gao[144,e], F.M. Garay Walls[46], F. Garberson[177], C. García[168], J.E. García Navarro[168], M. Garcia-Sciveres[15], R.W. Gardner[31], N. Garelli[144], V. Garonne[30], C. Gatti[47], G. Gaudio[120a], B. Gaur[142], L. Gauthier[94], P. Gauzzi[133a,133b], I.L. Gavrilenko[95], C. Gay[169], G. Gaycken[21], E.N. Gazis[10], P. Ge[33d], Z. Gecse[169], C.N.P. Gee[130], D.A.A. Geerts[106], Ch. Geich-Gimbel[21], K. Gellerstedt[147a,147b], C. Gemme[50a], A. Gemmell[53], M.H. Genest[55], S. Gentile[133a,133b], M. George[54], S. George[76], D. Gerbaudo[164], A. Gershon[154], H. Ghazlane[136b], N. Ghodbane[34], B. Giacobbe[20a], S. Giagu[133a,133b], V. Giangiobbe[12], P. Giannetti[123a,123b], F. Gianotti[30], B. Gibbard[25], S.M. Gibson[76], M. Gilchriese[15], T.P.S. Gillam[28], D. Gillberg[30], G. Gilles[34], D.M. Gingrich[3,d], N. Giokaris[9], M.P. Giordani[165a,165c], R. Giordano[103a,103b], F.M. Giorgi[20a], F.M. Giorgi[16], P.F. Giraud[137], D. Giugni[90a], C. Giuliani[48], M. Giulini[58b], B.K. Gjelsten[118], S. Gkaitatzis[155], I. Gkialas[155,l], L.K. Gladilin[98], C. Glasman[81], J. Glatzer[30], P.C.F. Glaysher[46], A. Glazov[42], G.L. Glonti[64], M. Goblirsch-Kolb[100], J.R. Goddard[75], J. Godlewski[30], C. Goeringer[82], S. Goldfarb[88], T. Golling[177], D. Golubkov[129], A. Gomes[125a,125b,125d], L.S. Gomez Fajardo[42], R. Gonçalo[125a], J. Goncalves Pinto Firmino Da Costa[137], L. Gonella[21], S. González de la Hoz[168], G. Gonzalez Parra[12], S. Gonzalez-Sevilla[49], L. Goossens[30], P.A. Gorbounov[96], H.A. Gordon[25], I. Gorelov[104], B. Gorini[30], E. Gorini[72a,72b], A. Gorišek[74], E. Gornicki[39], A.T. Goshaw[6], C. Gössling[43], M.I. Gostkin[64], M. Gouighri[136a], D. Goujdami[136c], M.P. Goulette[49], A.G. Goussiou[139], C. Goy[5], S. Gozpinar[23], H.M.X. Grabas[137], L. Graber[54], I. Grabowska-Bold[38a], P. Grafström[20a,20b], K-J. Grahn[42], J. Gramling[49], E. Gramstad[118], S. Grancagnolo[16], V. Grassi[149], V. Gratchev[122], H.M. Gray[30], E. Graziani[135a], O.G. Grebenyuk[122], Z.D. Greenwood[78,m], K. Gregersen[77], I.M. Gregor[42], P. Grenier[144], J. Griffiths[8], A.A. Grillo[138], K. Grimm[71], S. Grinstein[12,n], Ph. Gris[34], Y.V. Grishkevich[98], J.-F. Grivaz[116], J.P. Grohs[44], A. Grohsjean[42], E. Gross[173], J. Grosse-Knetter[54], G.C. Grossi[134a,134b], J. Groth-Jensen[173], Z.J. Grout[150], L. Guan[33b], F. Guescini[49], D. Guest[177], O. Gueta[154], C. Guicheney[34], E. Guido[50a,50b], T. Guillemin[116], S. Guindon[2], U. Gul[53], C. Gumpert[44], J. Gunther[127], J. Guo[35], S. Gupta[119], P. Gutierrez[112], N.G. Gutierrez Ortiz[53], C. Gutschow[77], N. Guttman[154], C. Guyot[137], C. Gwenlan[119], C.B. Gwilliam[73], A. Haas[109], C. Haber[15], H.K. Hadavand[8], N. Haddad[136e], P. Haefner[21], S. Hageböck[21], Z. Hajduk[39], H. Hakobyan[178], M. Haleem[42], D. Hall[119], G. Halladjian[89], K. Hamacher[176], P. Hamal[114], K. Hamano[170], M. Hamer[54], A. Hamilton[146a], S. Hamilton[162], G.N. Hamity[146c], P.G. Hamnett[42], L. Han[33b], K. Hanagaki[117], K. Hanawa[156], M. Hance[15], P. Hanke[58a], R. Hanna[137], J.B. Hansen[36], J.D. Hansen[36], P.H. Hansen[36], K. Hara[161], A.S. Hard[174], T. Harenberg[176], F. Hariri[116], S. Harkusha[91], D. Harper[88], R.D. Harrington[46], O.M. Harris[139], P.F. Harrison[171], F. Hartjes[106], M. Hasegawa[66], S. Hasegawa[102], Y. Hasegawa[141], A. Hasib[112], S. Hassani[137], S. Haug[17], M. Hauschild[30], R. Hauser[89], M. Havranek[126], C.M. Hawkes[18], R.J. Hawkings[30], A.D. Hawkins[80], T. Hayashi[161], D. Hayden[89], C.P. Hays[119], H.S. Hayward[73], S.J. Haywood[130], S.J. Head[18], T. Heck[82], V. Hedberg[80], L. Heelan[8], S. Heim[121], T. Heim[176], B. Heinemann[15], L. Heinrich[109], J. Hejbal[126], L. Helary[22], C. Heller[99], M. Heller[30], S. Hellman[147a,147b], D. Hellmich[21], C. Helsens[30], J. Henderson[119], R.C.W. Henderson[71], Y. Heng[174], C. Hengler[42], A. Henrichs[177], A.M. Henriques Correia[30], S. Henrot-Versille[116], C. Hensel[54], G.H. Herbert[16], Y. Hernández Jiménez[168], R. Herrberg-Schubert[16], G. Herten[48], R. Hertenberger[99], L. Hervas[30], G.G. Hesketh[77], N.P. Hessey[106], R. Hickling[75], E. Higón-Rodriguez[168], E. Hill[170], J.C. Hill[28], K.H. Hiller[42], S. Hillert[21], S.J. Hillier[18], I. Hinchliffe[15], E. Hines[121], M. Hirose[158], D. Hirschbuehl[176], J. Hobbs[149], N. Hod[106], M.C. Hodgkinson[140], P. Hodgson[140], A. Hoecker[30], M.R. Hoeferkamp[104], F. Hoenig[99], J. Hoffman[40], D. Hoffmann[84], J.I. Hofmann[58a], M. Hohlfeld[82], T.R. Holmes[15], T.M. Hong[121], L. Hooft van Huysduynen[109], W.H. Hopkins[115], Y. Horii[102], J-Y. Hostachy[55], S. Hou[152], A. Hoummada[136a], J. Howard[119], J. Howarth[42], M. Hrabovsky[114],

I. Hristova[16], J. Hrivnac[116], T. Hryn'ova[5], C. Hsu[146c], P.J. Hsu[82], S.-C. Hsu[139], D. Hu[35], X. Hu[25], Y. Huang[42], Z. Hubacek[30], F. Hubaut[84], F. Huegging[21], T.B. Huffman[119], E.W. Hughes[35], G. Hughes[71], M. Huhtinen[30], T.A. Hülsing[82], M. Hurwitz[15], N. Huseynov[64,b], J. Huston[89], J. Huth[57], G. Iacobucci[49], G. Iakovidis[10], I. Ibragimov[142], L. Iconomidou-Fayard[116], E. Ideal[177], P. Iengo[103a], O. Igonkina[106], T. Iizawa[172], Y. Ikegami[65], K. Ikematsu[142], M. Ikeno[65], Y. Ilchenko[31,o], D. Iliadis[155], N. Ilic[159], Y. Inamaru[66], T. Ince[100], P. Ioannou[9], M. Iodice[135a], K. Iordanidou[9], V. Ippolito[57], A. Irles Quiles[168], C. Isaksson[167], M. Ishino[67], M. Ishitsuka[158], R. Ishmukhametov[110], C. Issever[119], S. Istin[19a], J.M. Iturbe Ponce[83], R. Iuppa[134a,134b], J. Ivarsson[80], W. Iwanski[39], H. Iwasaki[65], J.M. Izen[41], V. Izzo[103a], B. Jackson[121], M. Jackson[73], P. Jackson[1], M.R. Jaekel[30], V. Jain[2], K. Jakobs[48], S. Jakobsen[30], T. Jakoubek[126], J. Jakubek[127], D.O. Jamin[152], D.K. Jana[78], E. Jansen[77], H. Jansen[30], J. Janssen[21], M. Janus[171], G. Jarlskog[80], N. Javadov[64,b], T. Javůrek[48], L. Jeanty[15], J. Jejelava[51a,p], G.-Y. Jeng[151], D. Jennens[87], P. Jenni[48,q], J. Jentzsch[43], C. Jeske[171], S. Jézéquel[5], H. Ji[174], J. Jia[149], Y. Jiang[33b], M. Jimenez Belenguer[42], S. Jin[33a], A. Jinaru[26a], O. Jinnouchi[158], M.D. Joergensen[36], K.E. Johansson[147a,147b], P. Johansson[140], K.A. Johns[7], K. Jon-And[147a,147b], G. Jones[171], R.W.L. Jones[71], T.J. Jones[73], J. Jongmanns[58a], P.M. Jorge[125a,125b], K.D. Joshi[83], J. Jovicevic[148], X. Ju[174], C.A. Jung[43], R.M. Jungst[30], P. Jussel[61], A. Juste Rozas[12,n], M. Kaci[168], A. Kaczmarska[39], M. Kado[116], H. Kagan[110], M. Kagan[144], E. Kajomovitz[45], C.W. Kalderon[119], S. Kama[40], A. Kamenshchikov[129], N. Kanaya[156], M. Kaneda[30], S. Kaneti[28], V.A. Kantserov[97], J. Kanzaki[65], B. Kaplan[109], A. Kapliy[31], D. Kar[53], K. Karakostas[10], N. Karastathis[10], M.J. Kareem[54], M. Karnevskiy[82], S.N. Karpov[64], Z.M. Karpova[64], K. Karthik[109], V. Kartvelishvili[71], A.N. Karyukhin[129], L. Kashif[174], G. Kasieczka[58b], R.D. Kass[110], A. Kastanas[14], Y. Kataoka[156], A. Katre[49], J. Katzy[42], V. Kaushik[7], K. Kawagoe[69], T. Kawamoto[156], G. Kawamura[54], S. Kazama[156], V.F. Kazanin[108], M.Y. Kazarinov[64], R. Keeler[170], R. Kehoe[40], M. Keil[54], J.S. Keller[42], J.J. Kempster[76], H. Keoshkerian[5], O. Kepka[126], B.P. Kerševan[74], S. Kersten[176], K. Kessoku[156], J. Keung[159], F. Khalil-zada[11], H. Khandanyan[147a,147b], A. Khanov[113], A. Khodinov[97], A. Khomich[58a], T.J. Khoo[28], G. Khoriauli[21], A. Khoroshilov[176], V. Khovanskiy[96], E. Khramov[64], J. Khubua[51b], H.Y. Kim[8], H. Kim[147a,147b], S.H. Kim[161], N. Kimura[172], O. Kind[16], B.T. King[73], M. King[168], R.S.B. King[119], S.B. King[169], J. Kirk[130], A.E. Kiryunin[100], T. Kishimoto[66], D. Kisielewska[38a], F. Kiss[48], T. Kittelmann[124], K. Kiuchi[161], E. Kladiva[145b], M. Klein[73], U. Klein[73], K. Kleinknecht[82], P. Klimek[147a,147b], A. Klimentov[25], R. Klingenberg[43], J.A. Klinger[83], T. Klioutchnikova[30], P.F. Klok[105], E.-E. Kluge[58a], P. Kluit[106], S. Kluth[100], E. Kneringer[61], E.B.F.G. Knoops[84], A. Knue[53], D. Kobayashi[158], T. Kobayashi[156], M. Kobel[44], M. Kocian[144], P. Kodys[128], P. Koevesarki[21], T. Koffas[29], E. Koffeman[106], L.A. Kogan[119], S. Kohlmann[176], Z. Kohout[127], T. Kohriki[65], T. Koi[144], H. Kolanoski[16], I. Koletsou[5], J. Koll[89], A.A. Komar[95,*], Y. Komori[156], T. Kondo[65], N. Kondrashova[42], K. Köneke[48], A.C. König[105], S. König[82], T. Kono[65,r], R. Konoplich[109,s], N. Konstantinidis[77], R. Kopeliansky[153], S. Koperny[38a], L. Köpke[82], A.K. Kopp[48], K. Korcyl[39], K. Kordas[155], A. Korn[77], A.A. Korol[108,t], I. Korolkov[12], E.V. Korolkova[140], V.A. Korotkov[129], O. Kortner[100], S. Kortner[100], V.V. Kostyukhin[21], V.M. Kotov[64], A. Kotwal[45], C. Kourkoumelis[9], V. Kouskoura[155], A. Koutsman[160a], R. Kowalewski[170], T.Z. Kowalski[38a], W. Kozanecki[137], A.S. Kozhin[129], V. Kral[127], V.A. Kramarenko[98], G. Kramberger[74], D. Krasnopevtsev[97], M.W. Krasny[79], A. Krasznahorkay[30], J.K. Kraus[21], A. Kravchenko[25], S. Kreiss[109], M. Kretz[58c], J. Kretzschmar[73], K. Kreutzfeldt[52], P. Krieger[159], K. Kroeninger[54], H. Kroha[100], J. Kroll[121], J. Kroseberg[21], J. Krstic[13a], U. Kruchonak[64], H. Krüger[21], T. Kruker[17], N. Krumnack[63], Z.V. Krumshteyn[64], A. Kruse[174], M.C. Kruse[45], M. Kruskal[22], T. Kubota[87], S. Kuday[4a], S. Kuehn[48], A. Kugel[58c], A. Kuhl[138], T. Kuhl[42], V. Kukhtin[64], Y. Kulchitsky[91], S. Kuleshov[32b], M. Kuna[133a,133b], J. Kunkle[121], A. Kupco[126], H. Kurashige[66], Y.A. Kurochkin[91], R. Kurumida[66], V. Kus[126], E.S. Kuwertz[148],

M. Kuze[158], J. Kvita[114], A. La Rosa[49], L. La Rotonda[37a,37b], C. Lacasta[168], F. Lacava[133a,133b], J. Lacey[29], H. Lacker[16], D. Lacour[79], V.R. Lacuesta[168], E. Ladygin[64], R. Lafaye[5], B. Laforge[79], T. Lagouri[177], S. Lai[48], H. Laier[58a], L. Lambourne[77], S. Lammers[60], C.L. Lampen[7], W. Lampl[7], E. Lançon[137], U. Landgraf[48], M.P.J. Landon[75], V.S. Lang[58a], A.J. Lankford[164], F. Lanni[25], K. Lantzsch[30], S. Laplace[79], C. Lapoire[21], J.F. Laporte[137], T. Lari[90a], F. Lasagni Manghi[20a,20b], M. Lassnig[30], P. Laurelli[47], W. Lavrijsen[15], A.T. Law[138], P. Laycock[73], O. Le Dortz[79], E. Le Guirriec[84], E. Le Menedeu[12], T. LeCompte[6], F. Ledroit-Guillon[55], C.A. Lee[152], H. Lee[106], J.S.H. Lee[117], S.C. Lee[152], L. Lee[1], G. Lefebvre[79], M. Lefebvre[170], F. Legger[99], C. Leggett[15], A. Lehan[73], M. Lehmacher[21], G. Lehmann Miotto[30], X. Lei[7], W.A. Leight[29], A. Leisos[155], A.G. Leister[177], M.A.L. Leite[24d], R. Leitner[128], D. Lellouch[173], B. Lemmer[54], K.J.C. Leney[77], T. Lenz[21], G. Lenzen[176], B. Lenzi[30], R. Leone[7], S. Leone[123a,123b], C. Leonidopoulos[46], S. Leontsinis[10], C. Leroy[94], C.G. Lester[28], C.M. Lester[121], M. Levchenko[122], J. Levêque[5], D. Levin[88], L.J. Levinson[173], M. Levy[18], A. Lewis[119], G.H. Lewis[109], A.M. Leyko[21], M. Leyton[41], B. Li[33b,u], B. Li[84], H. Li[149], H.L. Li[31], L. Li[45], L. Li[33e], S. Li[45], Y. Li[33c,v], Z. Liang[138], H. Liao[34], B. Liberti[134a], P. Lichard[30], K. Lie[166], J. Liebal[21], W. Liebig[14], C. Limbach[21], A. Limosani[87], S.C. Lin[152,w], T.H. Lin[82], F. Linde[106], B.E. Lindquist[149], J.T. Linnemann[89], E. Lipeles[121], A. Lipniacka[14], M. Lisovyi[42], T.M. Liss[166], D. Lissauer[25], A. Lister[169], A.M. Litke[138], B. Liu[152], D. Liu[152], J.B. Liu[33b], K. Liu[33b,x], L. Liu[88], M. Liu[45], M. Liu[33b], Y. Liu[33b], M. Livan[120a,120b], S.S.A. Livermore[119], A. Lleres[55], J. Llorente Merino[81], S.L. Lloyd[75], F. Lo Sterzo[152], E. Lobodzinska[42], P. Loch[7], W.S. Lockman[138], T. Loddenkoetter[21], F.K. Loebinger[83], A.E. Loevschall-Jensen[36], A. Loginov[177], T. Lohse[16], K. Lohwasser[42], M. Lokajicek[126], V.P. Lombardo[5], B.A. Long[22], J.D. Long[88], R.E. Long[71], L. Lopes[125a], D. Lopez Mateos[57], B. Lopez Paredes[140], I. Lopez Paz[12], J. Lorenz[99], N. Lorenzo Martinez[60], M. Losada[163], P. Loscutoff[15], X. Lou[41], A. Lounis[116], J. Love[6], P.A. Love[71], A.J. Lowe[144,e], F. Lu[33a], N. Lu[88], H.J. Lubatti[139], C. Luci[133a,133b], A. Lucotte[55], F. Luehring[60], W. Lukas[61], L. Luminari[133a], O. Lundberg[147a,147b], B. Lund-Jensen[148], M. Lungwitz[82], D. Lynn[25], R. Lysak[126], E. Lytken[80], H. Ma[25], L.L. Ma[33d], G. Maccarrone[47], A. Macchiolo[100], J. Machado Miguens[125a,125b], D. Macina[30], D. Madaffari[84], R. Madar[48], H.J. Maddocks[71], W.F. Mader[44], A. Madsen[167], M. Maeno[8], T. Maeno[25], A. Maevskiy[98], E. Magradze[54], K. Mahboubi[48], J. Mahlstedt[106], S. Mahmoud[73], C. Maiani[137], C. Maidantchik[24a], A.A. Maier[100], A. Maio[125a,125b,125d], S. Majewski[115], Y. Makida[65], N. Makovec[116], P. Mal[137,y], B. Malaescu[79], Pa. Malecki[39], V.P. Maleev[122], F. Malek[55], U. Mallik[62], D. Malon[6], C. Malone[144], S. Maltezos[10], V.M. Malyshev[108], S. Malyukov[30], J. Mamuzic[13b], B. Mandelli[30], L. Mandelli[90a], I. Mandić[74], R. Mandrysch[62], J. Maneira[125a,125b], A. Manfredini[100], L. Manhaes de Andrade Filho[24b], J.A. Manjarres Ramos[160b], A. Mann[99], P.M. Manning[138], A. Manousakis-Katsikakis[9], B. Mansoulie[137], R. Mantifel[86], L. Mapelli[30], L. March[168], J.F. Marchand[29], G. Marchiori[79], M. Marcisovsky[126], C.P. Marino[170], M. Marjanovic[13a], C.N. Marques[125a], F. Marroquim[24a], S.P. Marsden[83], Z. Marshall[15], L.F. Marti[17], S. Marti-Garcia[168], B. Martin[30], B. Martin[89], T.A. Martin[171], V.J. Martin[46], B. Martin dit Latour[14], H. Martinez[137], M. Martinez[12,n], S. Martin-Haugh[130], A.C. Martyniuk[77], M. Marx[139], F. Marzano[133a], A. Marzin[30], L. Masetti[82], T. Mashimo[156], R. Mashinistov[95], J. Masik[83], A.L. Maslennikov[108], I. Massa[20a,20b], L. Massa[20a,20b], N. Massol[5], P. Mastrandrea[149], A. Mastroberardino[37a,37b], T. Masubuchi[156], P. Mättig[176], J. Mattmann[82], J. Maurer[26a], S.J. Maxfield[73], D.A. Maximov[108,t], R. Mazini[152], L. Mazzaferro[134a,134b], G. Mc Goldrick[159], S.P. Mc Kee[88], A. McCarn[88], R.L. McCarthy[149], T.G. McCarthy[29], N.A. McCubbin[130], K.W. McFarlane[56,*], J.A. Mcfayden[77], G. Mchedlidze[54], S.J. McMahon[130], R.A. McPherson[170,i], J. Mechnich[106], M. Medinnis[42], S. Meehan[31], S. Mehlhase[99], A. Mehta[73], K. Meier[58a], C. Meineck[99], B. Meirose[80], C. Melachrinos[31], B.R. Mellado Garcia[146c], F. Meloni[17], A. Mengarelli[20a,20b], S. Menke[100], E. Meoni[162], K.M. Mercurio[57], S. Mergelmeyer[21], N. Meric[137], P. Mermod[49], L. Merola[103a,103b], C. Meroni[90a],

JHEP09(2015)141

F.S. Merritt[31], H. Merritt[110], A. Messina[30,z], J. Metcalfe[25], A.S. Mete[164], C. Meyer[82], C. Meyer[121], J-P. Meyer[137], J. Meyer[30], R.P. Middleton[130], S. Migas[73], L. Mijović[21], G. Mikenberg[173], M. Mikestikova[126], M. Mikuž[74], A. Milic[30], D.W. Miller[31], C. Mills[46], A. Milov[173], D.A. Milstead[147a,147b], D. Milstein[173], A.A. Minaenko[129], I.A. Minashvili[64], A.I. Mincer[109], B. Mindur[38a], M. Mineev[64], Y. Ming[174], L.M. Mir[12], G. Mirabelli[133a], T. Mitani[172], J. Mitrevski[99], V.A. Mitsou[168], S. Mitsui[65], A. Miucci[49], P.S. Miyagawa[140], J.U. Mjörnmark[80], T. Moa[147a,147b], K. Mochizuki[84], S. Mohapatra[35], W. Mohr[48], S. Molander[147a,147b], R. Moles-Valls[168], K. Mönig[42], C. Monini[55], J. Monk[36], E. Monnier[84], J. Montejo Berlingen[12], F. Monticelli[70], S. Monzani[133a,133b], R.W. Moore[3], N. Morange[62], D. Moreno[82], M. Moreno Llácer[54], P. Morettini[50a], M. Morgenstern[44], M. Morii[57], S. Moritz[82], A.K. Morley[148], G. Mornacchi[30], J.D. Morris[75], L. Morvaj[102], H.G. Moser[100], M. Mosidze[51b], J. Moss[110], K. Motohashi[158], R. Mount[144], E. Mountricha[25], S.V. Mouraviev[95,*], E.J.W. Moyse[85], S. Muanza[84], R.D. Mudd[18], F. Mueller[58a], J. Mueller[124], K. Mueller[21], T. Mueller[28], T. Mueller[82], D. Muenstermann[49], Y. Munwes[154], J.A. Murillo Quijada[18], W.J. Murray[171,130], H. Musheghyan[54], E. Musto[153], A.G. Myagkov[129,aa], M. Myska[127], O. Nackenhorst[54], J. Nadal[54], K. Nagai[61], R. Nagai[158], Y. Nagai[84], K. Nagano[65], A. Nagarkar[110], Y. Nagasaka[59], M. Nagel[100], A.M. Nairz[30], Y. Nakahama[30], K. Nakamura[65], T. Nakamura[156], I. Nakano[111], H. Namasivayam[41], G. Nanava[21], R. Narayan[58b], T. Nattermann[21], T. Naumann[42], G. Navarro[163], R. Nayyar[7], H.A. Neal[88], P.Yu. Nechaeva[95], T.J. Neep[83], P.D. Nef[144], A. Negri[120a,120b], G. Negri[30], M. Negrini[20a], S. Nektarijevic[49], A. Nelson[164], T.K. Nelson[144], S. Nemecek[126], P. Nemethy[109], A.A. Nepomuceno[24a], M. Nessi[30,ab], M.S. Neubauer[166], M. Neumann[176], R.M. Neves[109], P. Nevski[25], P.R. Newman[18], D.H. Nguyen[6], R.B. Nickerson[119], R. Nicolaidou[137], B. Nicquevert[30], J. Nielsen[138], N. Nikiforou[35], A. Nikiforov[16], V. Nikolaenko[129,aa], I. Nikolic-Audit[79], K. Nikolics[49], K. Nikolopoulos[18], P. Nilsson[8], Y. Ninomiya[156], A. Nisati[133a], R. Nisius[100], T. Nobe[158], L. Nodulman[6], M. Nomachi[117], I. Nomidis[29], S. Norberg[112], M. Nordberg[30], O. Novgorodova[44], S. Nowak[100], M. Nozaki[65], L. Nozka[114], K. Ntekas[10], G. Nunes Hanninger[87], T. Nunnemann[99], E. Nurse[77], F. Nuti[87], B.J. O'Brien[46], F. O'grady[7], D.C. O'Neil[143], V. O'Shea[53], F.G. Oakham[29,d], H. Oberlack[100], T. Obermann[21], J. Ocariz[79], A. Ochi[66], M.I. Ochoa[77], S. Oda[69], S. Odaka[65], H. Ogren[60], A. Oh[83], S.H. Oh[45], C.C. Ohm[15], H. Ohman[167], W. Okamura[117], H. Okawa[25], Y. Okumura[31], T. Okuyama[156], A. Olariu[26a], A.G. Olchevski[64], S.A. Olivares Pino[46], D. Oliveira Damazio[25], E. Oliver Garcia[168], A. Olszewski[39], J. Olszowska[39], A. Onofre[125a,125e], P.U.E. Onyisi[31,o], C.J. Oram[160a], M.J. Oreglia[31], Y. Oren[154], D. Orestano[135a,135b], N. Orlando[72a,72b], C. Oropeza Barrera[53], R.S. Orr[159], B. Osculati[50a,50b], R. Ospanov[121], G. Otero y Garzon[27], H. Otono[69], M. Ouchrif[136d], E.A. Ouellette[170], F. Ould-Saada[118], A. Ouraou[137], K.P. Oussoren[106], Q. Ouyang[33a], A. Ovcharova[15], M. Owen[83], V.E. Ozcan[19a], N. Ozturk[8], K. Pachal[119], A. Pacheco Pages[12], C. Padilla Aranda[12], M. Pagáčová[48], S. Pagan Griso[15], E. Paganis[140], C. Pahl[100], F. Paige[25], P. Pais[85], K. Pajchel[118], G. Palacino[160b], S. Palestini[30], M. Palka[38b], D. Pallin[34], A. Palma[125a,125b], J.D. Palmer[18], Y.B. Pan[174], E. Panagiotopoulou[10], J.G. Panduro Vazquez[76], P. Pani[106], N. Panikashvili[88], S. Panitkin[25], D. Pantea[26a], L. Paolozzi[134a,134b], Th.D. Papadopoulou[10], K. Papageorgiou[155,l], A. Paramonov[6], D. Paredes Hernandez[34], M.A. Parker[28], F. Parodi[50a,50b], J.A. Parsons[35], U. Parzefall[48], E. Pasqualucci[133a], S. Passaggio[50a], A. Passeri[135a], F. Pastore[135a,135b,*], Fr. Pastore[76], G. Pásztor[29], S. Pataraia[176], N.D. Patel[151], J.R. Pater[83], S. Patricelli[103a,103b], T. Pauly[30], J. Pearce[170], L.E. Pedersen[36], M. Pedersen[118], S. Pedraza Lopez[168], R. Pedro[125a,125b], S.V. Peleganchuk[108], D. Pelikan[167], H. Peng[33b], B. Penning[31], J. Penwell[60], D.V. Perepelitsa[25], E. Perez Codina[160a], M.T. Pérez García-Estañ[168], V. Perez Reale[35], L. Perini[90a,90b], H. Pernegger[30], S. Perrella[103a,103b], R. Perrino[72a], R. Peschke[42], V.D. Peshekhonov[64], K. Peters[30], R.F.Y. Peters[83], B.A. Petersen[30], T.C. Petersen[36], E. Petit[42], A. Petridis[147a,147b], C. Petridou[155],

E. Petrolo[133a], F. Petrucci[135a,135b], N.E. Pettersson[158], R. Pezoa[32b], P.W. Phillips[130], G. Piacquadio[144], E. Pianori[171], A. Picazio[49], E. Piccaro[75], M. Piccinini[20a,20b], R. Piegaia[27], D.T. Pignotti[110], J.E. Pilcher[31], A.D. Pilkington[77], J. Pina[125a,125b,125d], M. Pinamonti[165a,165c,ac], A. Pinder[119], J.L. Pinfold[3], A. Pingel[36], B. Pinto[125a], S. Pires[79], M. Pitt[173], C. Pizio[90a,90b], L. Plazak[145a], M.-A. Pleier[25], V. Pleskot[128], E. Plotnikova[64], P. Plucinski[147a,147b], S. Poddar[58a], F. Podlyski[34], R. Poettgen[82], L. Poggioli[116], D. Pohl[21], M. Pohl[49], G. Polesello[120a], A. Policicchio[37a,37b], R. Polifka[159], A. Polini[20a], C.S. Pollard[45], V. Polychronakos[25], K. Pommès[30], L. Pontecorvo[133a], B.G. Pope[89], G.A. Popeneciu[26b], D.S. Popovic[13a], A. Poppleton[30], X. Portell Bueso[12], S. Pospisil[127], K. Potamianos[15], I.N. Potrap[64], C.J. Potter[150], C.T. Potter[115], G. Poulard[30], J. Poveda[60], V. Pozdnyakov[64], P. Pralavorio[84], A. Pranko[15], S. Prasad[30], R. Pravahan[8], S. Prell[63], D. Price[83], J. Price[73], L.E. Price[6], D. Prieur[124], M. Primavera[72a], M. Proissl[46], K. Prokofiev[47], F. Prokoshin[32b], E. Protopapadaki[137], S. Protopopescu[25], J. Proudfoot[6], M. Przybycien[38a], H. Przysiezniak[5], E. Ptacek[115], D. Puddu[135a,135b], E. Pueschel[85], D. Puldon[149], M. Purohit[25,ad], P. Puzo[116], J. Qian[88], G. Qin[53], Y. Qin[83], A. Quadt[54], D.R. Quarrie[15], W.B. Quayle[165a,165b], M. Queitsch-Maitland[83], D. Quilty[53], A. Qureshi[160b], V. Radeka[25], V. Radescu[42], S.K. Radhakrishnan[149], P. Radloff[115], P. Rados[87], F. Ragusa[90a,90b], G. Rahal[179], S. Rajagopalan[25], M. Rammensee[30], A.S. Randle-Conde[40], C. Rangel-Smith[167], K. Rao[164], F. Rauscher[99], T.C. Rave[48], T. Ravenscroft[53], M. Raymond[30], A.L. Read[118], N.P. Readioff[73], D.M. Rebuzzi[120a,120b], A. Redelbach[175], G. Redlinger[25], R. Reece[138], K. Reeves[41], L. Rehnisch[16], H. Reisin[27], M. Relich[164], C. Rembser[30], H. Ren[33a], Z.L. Ren[152], A. Renaud[116], M. Rescigno[133a], S. Resconi[90a], O.L. Rezanova[108,t], P. Reznicek[128], R. Rezvani[94], R. Richter[100], M. Ridel[79], P. Rieck[16], J. Rieger[54], M. Rijssenbeek[149], A. Rimoldi[120a,120b], L. Rinaldi[20a], E. Ritsch[61], I. Riu[12], F. Rizatdinova[113], E. Rizvi[75], S.H. Robertson[86,i], A. Robichaud-Veronneau[86], D. Robinson[28], J.E.M. Robinson[83], A. Robson[53], C. Roda[123a,123b], L. Rodrigues[30], S. Roe[30], O. Røhne[118], S. Rolli[162], A. Romaniouk[97], M. Romano[20a,20b], E. Romero Adam[168], N. Rompotis[139], M. Ronzani[48], L. Roos[79], E. Ros[168], S. Rosati[133a], K. Rosbach[49], M. Rose[76], P. Rose[138], P.L. Rosendahl[14], O. Rosenthal[142], V. Rossetti[147a,147b], E. Rossi[103a,103b], L.P. Rossi[50a], R. Rosten[139], M. Rotaru[26a], I. Roth[173], J. Rothberg[139], D. Rousseau[116], C.R. Royon[137], A. Rozanov[84], Y. Rozen[153], X. Ruan[146c], F. Rubbo[12], I. Rubinskiy[42], V.I. Rud[98], C. Rudolph[44], M.S. Rudolph[159], F. Rühr[48], A. Ruiz-Martinez[30], Z. Rurikova[48], N.A. Rusakovich[64], A. Ruschke[99], J.P. Rutherfoord[7], N. Ruthmann[48], Y.F. Ryabov[122], M. Rybar[128], G. Rybkin[116], N.C. Ryder[119], A.F. Saavedra[151], S. Sacerdoti[27], A. Saddique[3], I. Sadeh[154], H.F-W. Sadrozinski[138], R. Sadykov[64], F. Safai Tehrani[133a], H. Sakamoto[156], Y. Sakurai[172], G. Salamanna[135a,135b], A. Salamon[134a], M. Saleem[112], D. Salek[106], P.H. Sales De Bruin[139], D. Salihagic[100], A. Salnikov[144], J. Salt[168], D. Salvatore[37a,37b], F. Salvatore[150], A. Salvucci[105], A. Salzburger[30], D. Sampsonidis[155], A. Sanchez[103a,103b], J. Sánchez[168], V. Sanchez Martinez[168], H. Sandaker[14], R.L. Sandbach[75], H.G. Sander[82], M.P. Sanders[99], M. Sandhoff[176], T. Sandoval[28], C. Sandoval[163], R. Sandstroem[100], D.P.C. Sankey[130], A. Sansoni[47], C. Santoni[34], R. Santonico[134a,134b], H. Santos[125a], I. Santoyo Castillo[150], K. Sapp[124], A. Sapronov[64], J.G. Saraiva[125a,125d], B. Sarrazin[21], G. Sartisohn[176], O. Sasaki[65], Y. Sasaki[156], G. Sauvage[5,*], E. Sauvan[5], P. Savard[159,d], D.O. Savu[30], C. Sawyer[119], L. Sawyer[78,m], D.H. Saxon[53], J. Saxon[121], C. Sbarra[20a], A. Sbrizzi[3], T. Scanlon[77], D.A. Scannicchio[164], M. Scarcella[151], V. Scarfone[37a,37b], J. Schaarschmidt[173], P. Schacht[100], D. Schaefer[30], R. Schaefer[42], S. Schaepe[21], S. Schaetzel[58b], U. Schäfer[82], A.C. Schaffer[116], D. Schaile[99], R.D. Schamberger[149], V. Scharf[58a], V.A. Schegelsky[122], D. Scheirich[128], M. Schernau[164], M.I. Scherzer[35], C. Schiavi[50a,50b], J. Schieck[99], C. Schillo[48], M. Schioppa[37a,37b], S. Schlenker[30], E. Schmidt[48], K. Schmieden[30], C. Schmitt[82], S. Schmitt[58b], B. Schneider[17], Y.J. Schnellbach[73], U. Schnoor[44], L. Schoeffel[137], A. Schoening[58b], B.D. Schoenrock[89], A.L.S. Schorlemmer[54], M. Schott[82], D. Schouten[160a],

JHEP09(2015)141

J. Schovancova[25], S. Schramm[159], M. Schreyer[175], C. Schroeder[82], N. Schuh[82], M.J. Schultens[21], H.-C. Schultz-Coulon[58a], H. Schulz[16], M. Schumacher[48], B.A. Schumm[138], Ph. Schune[137], C. Schwanenberger[83], A. Schwartzman[144], T.A. Schwarz[88], Ph. Schwegler[100], Ph. Schwemling[137], R. Schwienhorst[89], J. Schwindling[137], T. Schwindt[21], M. Schwoerer[5], F.G. Sciacca[17], E. Scifo[116], G. Sciolla[23], W.G. Scott[130], F. Scuri[123a,123b], F. Scutti[21], J. Searcy[88], G. Sedov[42], E. Sedykh[122], S.C. Seidel[104], A. Seiden[138], F. Seifert[127], J.M. Seixas[24a], G. Sekhniaidze[103a], S.J. Sekula[40], K.E. Selbach[46], D.M. Seliverstov[122,*], G. Sellers[73], N. Semprini-Cesari[20a,20b], C. Serfon[30], L. Serin[116], L. Serkin[54], T. Serre[84], R. Seuster[160a], H. Severini[112], T. Sfiligoj[74], F. Sforza[100], A. Sfyrla[30], E. Shabalina[54], M. Shamim[115], L.Y. Shan[33a], R. Shang[166], J.T. Shank[22], M. Shapiro[15], P.B. Shatalov[96], K. Shaw[165a,165b], C.Y. Shehu[150], P. Sherwood[77], L. Shi[152,ae], S. Shimizu[66], C.O. Shimmin[164], M. Shimojima[101], M. Shiyakova[64], A. Shmeleva[95], M.J. Shochet[31], D. Short[119], S. Shrestha[63], E. Shulga[97], M.A. Shupe[7], S. Shushkevich[42], P. Sicho[126], O. Sidiropoulou[155], D. Sidorov[113], A. Sidoti[133a], F. Siegert[44], Dj. Sijacki[13a], J. Silva[125a,125d], Y. Silver[154], D. Silverstein[144], S.B. Silverstein[147a], V. Simak[127], O. Simard[5], Lj. Simic[13a], S. Simion[116], E. Simioni[82], B. Simmons[77], R. Simoniello[90a,90b], M. Simonyan[36], P. Sinervo[159], N.B. Sinev[115], V. Sipica[142], G. Siragusa[175], A. Sircar[78], A.N. Sisakyan[64,*], S.Yu. Sivoklokov[98], J. Sjölin[147a,147b], T.B. Sjursen[14], H.P. Skottowe[57], K.Yu. Skovpen[108], P. Skubic[112], M. Slater[18], T. Slavicek[127], K. Sliwa[162], V. Smakhtin[173], B.H. Smart[46], L. Smestad[14], S.Yu. Smirnov[97], Y. Smirnov[97], L.N. Smirnova[98,af], O. Smirnova[80], K.M. Smith[53], M. Smizanska[71], K. Smolek[127], A.A. Snesarev[95], G. Snidero[75], S. Snyder[25], R. Sobie[170,i], F. Socher[44], A. Soffer[154], D.A. Soh[152,ae], C.A. Solans[30], M. Solar[127], J. Solc[127], E.Yu. Soldatov[97], U. Soldevila[168], A.A. Solodkov[129], A. Soloshenko[64], O.V. Solovyanov[129], V. Solovyev[122], P. Sommer[48], H.Y. Song[33b], N. Soni[1], A. Sood[15], A. Sopczak[127], B. Sopko[127], V. Sopko[127], V. Sorin[12], M. Sosebee[8], R. Soualah[165a,165c], P. Soueid[94], A.M. Soukharev[108], D. South[42], S. Spagnolo[72a,72b], F. Spanò[76], W.R. Spearman[57], F. Spettel[100], R. Spighi[20a], G. Spigo[30], L.A. Spiller[87], M. Spousta[128], T. Spreitzer[159], B. Spurlock[8], R.D. St. Denis[53,*], S. Staerz[44], J. Stahlman[121], R. Stamen[58a], S. Stamm[16], E. Stanecka[39], R.W. Stanek[6], C. Stanescu[135a], M. Stanescu-Bellu[42], M.M. Stanitzki[42], S. Stapnes[118], E.A. Starchenko[129], J. Stark[55], P. Staroba[126], P. Starovoitov[42], R. Staszewski[39], P. Stavina[145a,*], P. Steinberg[25], B. Stelzer[143], H.J. Stelzer[30], O. Stelzer-Chilton[160a], H. Stenzel[52], S. Stern[100], G.A. Stewart[53], J.A. Stillings[21], M.C. Stockton[86], M. Stoebe[86], G. Stoicea[26a], P. Stolte[54], S. Stonjek[100], A.R. Stradling[8], A. Straessner[44], M.E. Stramaglia[17], J. Strandberg[148], S. Strandberg[147a,147b], A. Strandlie[118], E. Strauss[144], M. Strauss[112], P. Strizenec[145b], R. Ströhmer[175], D.M. Strom[115], R. Stroynowski[40], A. Struebig[105], S.A. Stucci[17], B. Stugu[14], N.A. Styles[42], D. Su[144], J. Su[124], R. Subramaniam[78], A. Succurro[12], Y. Sugaya[117], C. Suhr[107], M. Suk[127], V.V. Sulin[95], S. Sultansoy[4c], T. Sumida[67], S. Sun[57], X. Sun[33a], J.E. Sundermann[48], K. Suruliz[140], G. Susinno[37a,37b], M.R. Sutton[150], Y. Suzuki[65], M. Svatos[126], S. Swedish[169], M. Swiatlowski[144], I. Sykora[145a], T. Sykora[128], D. Ta[89], C. Taccini[135a,135b], K. Tackmann[42], J. Taenzer[159], A. Taffard[164], R. Tafirout[160a], N. Taiblum[154], H. Takai[25], R. Takashima[68], H. Takeda[66], T. Takeshita[141], Y. Takubo[65], M. Talby[84], A.A. Talyshev[108,t], J.Y.C. Tam[175], K.G. Tan[87], J. Tanaka[156], R. Tanaka[116], S. Tanaka[132], S. Tanaka[65], A.J. Tanasijczuk[143], B.B. Tannenwald[110], N. Tannoury[21], S. Tapprogge[82], S. Tarem[153], F. Tarrade[29], G.F. Tartarelli[90a], P. Tas[128], M. Tasevsky[126], T. Tashiro[67], E. Tassi[37a,37b], A. Tavares Delgado[125a,125b], Y. Tayalati[136d], F.E. Taylor[93], G.N. Taylor[87], W. Taylor[160b], F.A. Teischinger[30], M. Teixeira Dias Castanheira[75], P. Teixeira-Dias[76], K.K. Temming[48], H. Ten Kate[30], P.K. Teng[152], J.J. Teoh[117], S. Terada[65], K. Terashi[156], J. Terron[81], S. Terzo[100], M. Testa[47], R.J. Teuscher[159,i], J. Therhaag[21], T. Theveneaux-Pelzer[34], J.P. Thomas[18], J. Thomas-Wilsker[76], E.N. Thompson[35], P.D. Thompson[18], P.D. Thompson[159], R.J. Thompson[83], A.S. Thompson[53], L.A. Thomsen[36], E. Thomson[121], M. Thomson[28], W.M. Thong[87], R.P. Thun[88,*], F. Tian[35], M.J. Tibbetts[15], V.O. Tikhomirov[95,ag], Yu.A. Tikhonov[108,t], S. Timoshenko[97], E. Tiouchichine[84], P. Tipton[177], S. Tisserant[84], T. Todorov[5], S. Todorova-Nova[128], B. Toggerson[7], J. Tojo[69], S. Tokár[145a], K. Tokushuku[65], K. Tollefson[89], E. Tolley[57], L. Tomlinson[83], M. Tomoto[102], L. Tompkins[31], K. Toms[104], N.D. Topilin[64], E. Torrence[115], H. Torres[143], E. Torró Pastor[168], J. Toth[84,ah], F. Touchard[84], D.R. Tovey[140], H.L. Tran[116], T. Trefzger[175], L. Tremblet[30], A. Tricoli[30], I.M. Trigger[160a], S. Trincaz-Duvoid[79], M.F. Tripiana[12], W. Trischuk[159], B. Trocmé[55], C. Troncon[90a], M. Trottier-McDonald[15], M. Trovatelli[135a,135b], P. True[89], M. Trzebinski[39], A. Trzupek[39], C. Tsarouchas[30], J.C-L. Tseng[119], P.V. Tsiareshka[91], D. Tsionou[137], G. Tsipolitis[10], N. Tsirintanis[9], S. Tsiskaridze[12], V. Tsiskaridze[48], E.G. Tskhadadze[51a], I.I. Tsukerman[96], V. Tsulaia[15], S. Tsuno[65], D. Tsybychev[149], A. Tudorache[26a], V. Tudorache[26a], A.N. Tuna[121], S.A. Tupputi[20a,20b], S. Turchikhin[98,af], D. Turecek[127], I. Turk Cakir[4d], R. Turra[90a,90b], P.M. Tuts[35], A. Tykhonov[49], M. Tylmad[147a,147b], M. Tyndel[130], K. Uchida[21], I. Ueda[156], R. Ueno[29], M. Ughetto[84], M. Ugland[14], M. Uhlenbrock[21], F. Ukegawa[161], G. Unal[30], A. Undrus[25], G. Unel[164], F.C. Ungaro[48], Y. Unno[65], C. Unverdorben[99], D. Urbaniec[35], P. Urquijo[87], G. Usai[8], A. Usanova[61], L. Vacavant[84], V. Vacek[127], B. Vachon[86], N. Valencic[106], S. Valentinetti[20a,20b], A. Valero[168], L. Valery[34], S. Valkar[128], E. Valladolid Gallego[168], S. Vallecorsa[49], J.A. Valls Ferrer[168], W. Van Den Wollenberg[106], P.C. Van Der Deijl[106], R. van der Geer[106], H. van der Graaf[106], R. Van Der Leeuw[106], D. van der Ster[30], N. van Eldik[30], P. van Gemmeren[6], J. Van Nieuwkoop[143], I. van Vulpen[106], M.C. van Woerden[30], M. Vanadia[133a,133b], W. Vandelli[30], R. Vanguri[121], A. Vaniachine[6], P. Vankov[42], F. Vannucci[79], G. Vardanyan[178], R. Vari[133a], E.W. Varnes[7], T. Varol[85], D. Varouchas[79], A. Vartapetian[8], K.E. Varvell[151], F. Vazeille[34], T. Vazquez Schroeder[54], J. Veatch[7], F. Veloso[125a,125c], S. Veneziano[133a], A. Ventura[72a,72b], D. Ventura[85], M. Venturi[170], N. Venturi[159], A. Venturini[23], V. Vercesi[120a], M. Verducci[133a,133b], W. Verkerke[106], J.C. Vermeulen[106], A. Vest[44], M.C. Vetterli[143,d], O. Viazlo[80], I. Vichou[166], T. Vickey[146c,ai], O.E. Vickey Boeriu[146c], G.H.A. Viehhauser[119], S. Viel[169], R. Vigne[30], M. Villa[20a,20b], M. Villaplana Perez[90a,90b], E. Vilucchi[47], M.G. Vincter[29], V.B. Vinogradov[64], J. Virzi[15], I. Vivarelli[150], F. Vives Vaque[3], S. Vlachos[10], D. Vladoiu[99], M. Vlasak[127], A. Vogel[21], M. Vogel[32a], P. Vokac[127], G. Volpi[123a,123b], M. Volpi[87], H. von der Schmitt[100], H. von Radziewski[48], E. von Toerne[21], V. Vorobel[128], K. Vorobev[97], M. Vos[168], R. Voss[30], J.H. Vossebeld[73], N. Vranjes[137], M. Vranjes Milosavljevic[13a], V. Vrba[126], M. Vreeswijk[106], T. Vu Anh[48], R. Vuillermet[30], I. Vukotic[31], Z. Vykydal[127], P. Wagner[21], W. Wagner[176], H. Wahlberg[70], S. Wahrmund[44], J. Wakabayashi[102], J. Walder[71], R. Walker[99], W. Walkowiak[142], R. Wall[177], P. Waller[73], B. Walsh[177], C. Wang[152,aj], C. Wang[45], F. Wang[174], H. Wang[15], H. Wang[40], J. Wang[42], J. Wang[33a], K. Wang[86], R. Wang[104], S.M. Wang[152], T. Wang[21], X. Wang[177], C. Wanotayaroj[115], A. Warburton[86], C.P. Ward[28], D.R. Wardrope[77], M. Warsinsky[48], A. Washbrook[46], C. Wasicki[42], P.M. Watkins[18], A.T. Watson[18], I.J. Watson[151], M.F. Watson[18], G. Watts[139], S. Watts[83], B.M. Waugh[77], S. Webb[83], M.S. Weber[17], S.W. Weber[175], J.S. Webster[31], A.R. Weidberg[119], P. Weigell[100], B. Weinert[60], J. Weingarten[54], C. Weiser[48], H. Weits[106], P.S. Wells[30], T. Wenaus[25], D. Wendland[16], Z. Weng[152,ae], T. Wengler[30], S. Wenig[30], N. Wermes[21], M. Werner[48], P. Werner[30], M. Wessels[58a], J. Wetter[162], K. Whalen[29], A. White[8], M.J. White[1], R. White[32b], S. White[123a,123b], D. Whiteson[164], D. Wicke[176], F.J. Wickens[130], W. Wiedenmann[174], M. Wielers[130], P. Wienemann[21], C. Wiglesworth[36], L.A.M. Wiik-Fuchs[21], P.A. Wijeratne[77], A. Wildauer[100], M.A. Wildt[42,ak], H.G. Wilkens[30], J.Z. Will[99], H.H. Williams[121], S. Williams[28], C. Willis[89], S. Willocq[85], A. Wilson[88], J.A. Wilson[18], I. Wingerter-Seez[5], F. Winklmeier[115], B.T. Winter[21], M. Wittgen[144], T. Wittig[43], J. Wittkowski[99], S.J. Wollstadt[82], M.W. Wolter[39], H. Wolters[125a,125c], B.K. Wosiek[39], J. Wotschack[30], M.J. Woudstra[83], K.W. Wozniak[39], M. Wright[53], M. Wu[55], S.L. Wu[174], X. Wu[49], Y. Wu[88], E. Wulf[35], T.R. Wyatt[83], B.M. Wynne[46], S. Xella[36], M. Xiao[137], D. Xu[33a], L. Xu[33b,al], B. Yabsley[151], S. Yacoob[146b,am], R. Yakabe[66], M. Yamada[65], H. Yamaguchi[156], Y. Yamaguchi[117],

JHEP09(2015)141

A. Yamamoto[65], K. Yamamoto[63], S. Yamamoto[156], T. Yamamura[156], T. Yamanaka[156], K. Yamauchi[102], Y. Yamazaki[66], Z. Yan[22], H. Yang[33e], H. Yang[174], U.K. Yang[83], Y. Yang[110], S. Yanush[92], L. Yao[33a], W-M. Yao[15], Y. Yasu[65], E. Yatsenko[42], K.H. Yau Wong[21], J. Ye[40], S. Ye[25], I. Yeletskikh[64], A.L. Yen[57], E. Yildirim[42], M. Yilmaz[4b], R. Yoosoofmiya[124], K. Yorita[172], R. Yoshida[6], K. Yoshihara[156], C. Young[144], C.J.S. Young[30], S. Youssef[22], D.R. Yu[15], J. Yu[8], J.M. Yu[88], J. Yu[113], L. Yuan[66], A. Yurkewicz[107], I. Yusuff[28,an], B. Zabinski[39], R. Zaidan[62], A.M. Zaitsev[129,aa], A. Zaman[149], S. Zambito[23], L. Zanello[133a,133b], D. Zanzi[100], C. Zeitnitz[176], M. Zeman[127], A. Zemla[38a], K. Zengel[23], O. Zenin[129], T. Ženiš[145a], D. Zerwas[116], G. Zevi della Porta[57], D. Zhang[88], F. Zhang[174], H. Zhang[89], J. Zhang[6], L. Zhang[152], X. Zhang[33d], Z. Zhang[116], Z. Zhao[33b], A. Zhemchugov[64], J. Zhong[119], B. Zhou[88], L. Zhou[35], N. Zhou[164], C.G. Zhu[33d], H. Zhu[33a], J. Zhu[88], Y. Zhu[33b], X. Zhuang[33a], K. Zhukov[95], A. Zibell[175], D. Zieminska[60], N.I. Zimine[64], C. Zimmermann[82], R. Zimmermann[21], S. Zimmermann[21], S. Zimmermann[48], Z. Zinonos[54], M. Ziolkowski[142], G. Zobernig[174], A. Zoccoli[20a,20b], M. zur Nedden[16], G. Zurzolo[103a,103b], V. Zutshi[107], L. Zwalinski[30].

[1] *Department of Physics, University of Adelaide, Adelaide, Australia*
[2] *Physics Department, SUNY Albany, Albany NY, United States of America*
[3] *Department of Physics, University of Alberta, Edmonton AB, Canada*
[4] [(a)] *Department of Physics, Ankara University, Ankara;* [(b)] *Department of Physics, Gazi University, Ankara;* [(c)] *Division of Physics, TOBB University of Economics and Technology, Ankara;* [(d)] *Turkish Atomic Energy Authority, Ankara, Turkey*
[5] *LAPP, CNRS/IN2P3 and Université de Savoie, Annecy-le-Vieux, France*
[6] *High Energy Physics Division, Argonne National Laboratory, Argonne IL, United States of America*
[7] *Department of Physics, University of Arizona, Tucson AZ, United States of America*
[8] *Department of Physics, The University of Texas at Arlington, Arlington TX, United States of America*
[9] *Physics Department, University of Athens, Athens, Greece*
[10] *Physics Department, National Technical University of Athens, Zografou, Greece*
[11] *Institute of Physics, Azerbaijan Academy of Sciences, Baku, Azerbaijan*
[12] *Institut de Física d'Altes Energies and Departament de Física de la Universitat Autònoma de Barcelona, Barcelona, Spain*
[13] [(a)] *Institute of Physics, University of Belgrade, Belgrade;* [(b)] *Vinca Institute of Nuclear Sciences, University of Belgrade, Belgrade, Serbia*
[14] *Department for Physics and Technology, University of Bergen, Bergen, Norway*
[15] *Physics Division, Lawrence Berkeley National Laboratory and University of California, Berkeley CA, United States of America*
[16] *Department of Physics, Humboldt University, Berlin, Germany*
[17] *Albert Einstein Center for Fundamental Physics and Laboratory for High Energy Physics, University of Bern, Bern, Switzerland*
[18] *School of Physics and Astronomy, University of Birmingham, Birmingham, United Kingdom*
[19] [(a)] *Department of Physics, Bogazici University, Istanbul;* [(b)] *Department of Physics, Dogus University, Istanbul;* [(c)] *Department of Physics Engineering, Gaziantep University, Gaziantep, Turkey*
[20] [(a)] *INFN Sezione di Bologna;* [(b)] *Dipartimento di Fisica e Astronomia, Università di Bologna, Bologna, Italy*
[21] *Physikalisches Institut, University of Bonn, Bonn, Germany*
[22] *Department of Physics, Boston University, Boston MA, United States of America*
[23] *Department of Physics, Brandeis University, Waltham MA, United States of America*
[24] [(a)] *Universidade Federal do Rio De Janeiro COPPE/EE/IF, Rio de Janeiro;* [(b)] *Federal University of Juiz de Fora (UFJF), Juiz de Fora;* [(c)] *Federal University of Sao Joao del Rei (UFSJ), Sao Joao del Rei;* [(d)] *Instituto de Fisica, Universidade de Sao Paulo, Sao Paulo, Brazil*

JHEP09(2015)141

[25] Physics Department, Brookhaven National Laboratory, Upton NY, United States of America
[26] [(a)] National Institute of Physics and Nuclear Engineering, Bucharest; [(b)] National Institute for Research and Development of Isotopic and Molecular Technologies, Physics Department, Cluj Napoca; [(c)] University Politehnica Bucharest, Bucharest; [(d)] West University in Timisoara, Timisoara, Romania
[27] Departamento de Física, Universidad de Buenos Aires, Buenos Aires, Argentina
[28] Cavendish Laboratory, University of Cambridge, Cambridge, United Kingdom
[29] Department of Physics, Carleton University, Ottawa ON, Canada
[30] CERN, Geneva, Switzerland
[31] Enrico Fermi Institute, University of Chicago, Chicago IL, United States of America
[32] [(a)] Departamento de Física, Pontificia Universidad Católica de Chile, Santiago; [(b)] Departamento de Física, Universidad Técnica Federico Santa María, Valparaíso, Chile
[33] [(a)] Institute of High Energy Physics, Chinese Academy of Sciences, Beijing; [(b)] Department of Modern Physics, University of Science and Technology of China, Anhui; [(c)] Department of Physics, Nanjing University, Jiangsu; [(d)] School of Physics, Shandong University, Shandong; [(e)] Physics Department, Shanghai Jiao Tong University, Shanghai, China
[34] Laboratoire de Physique Corpusculaire, Clermont Université and Université Blaise Pascal and CNRS/IN2P3, Clermont-Ferrand, France
[35] Nevis Laboratory, Columbia University, Irvington NY, United States of America
[36] Niels Bohr Institute, University of Copenhagen, Kobenhavn, Denmark
[37] [(a)] INFN Gruppo Collegato di Cosenza, Laboratori Nazionali di Frascati; [(b)] Dipartimento di Fisica, Università della Calabria, Rende, Italy
[38] [(a)] AGH University of Science and Technology, Faculty of Physics and Applied Computer Science, Krakow; [(b)] Marian Smoluchowski Institute of Physics, Jagiellonian University, Krakow, Poland
[39] The Henryk Niewodniczanski Institute of Nuclear Physics, Polish Academy of Sciences, Krakow, Poland
[40] Physics Department, Southern Methodist University, Dallas TX, United States of America
[41] Physics Department, University of Texas at Dallas, Richardson TX, United States of America
[42] DESY, Hamburg and Zeuthen, Germany
[43] Institut für Experimentelle Physik IV, Technische Universität Dortmund, Dortmund, Germany
[44] Institut für Kern- und Teilchenphysik, Technische Universität Dresden, Dresden, Germany
[45] Department of Physics, Duke University, Durham NC, United States of America
[46] SUPA - School of Physics and Astronomy, University of Edinburgh, Edinburgh, United Kingdom
[47] INFN Laboratori Nazionali di Frascati, Frascati, Italy
[48] Fakultät für Mathematik und Physik, Albert-Ludwigs-Universität, Freiburg, Germany
[49] Section de Physique, Université de Genève, Geneva, Switzerland
[50] [(a)] INFN Sezione di Genova; [(b)] Dipartimento di Fisica, Università di Genova, Genova, Italy
[51] [(a)] E. Andronikashvili Institute of Physics, Iv. Javakhishvili Tbilisi State University, Tbilisi; [(b)] High Energy Physics Institute, Tbilisi State University, Tbilisi, Georgia
[52] II Physikalisches Institut, Justus-Liebig-Universität Giessen, Giessen, Germany
[53] SUPA - School of Physics and Astronomy, University of Glasgow, Glasgow, United Kingdom
[54] II Physikalisches Institut, Georg-August-Universität, Göttingen, Germany
[55] Laboratoire de Physique Subatomique et de Cosmologie, Université Grenoble-Alpes, CNRS/IN2P3, Grenoble, France
[56] Department of Physics, Hampton University, Hampton VA, United States of America
[57] Laboratory for Particle Physics and Cosmology, Harvard University, Cambridge MA, United States of America
[58] [(a)] Kirchhoff-Institut für Physik, Ruprecht-Karls-Universität Heidelberg, Heidelberg; [(b)] Physikalisches Institut, Ruprecht-Karls-Universität Heidelberg, Heidelberg; [(c)] ZITI Institut für technische Informatik, Ruprecht-Karls-Universität Heidelberg, Mannheim, Germany
[59] Faculty of Applied Information Science, Hiroshima Institute of Technology, Hiroshima, Japan
[60] Department of Physics, Indiana University, Bloomington IN, United States of America
[61] Institut für Astro- und Teilchenphysik, Leopold-Franzens-Universität, Innsbruck, Austria

[62] *University of Iowa, Iowa City IA, United States of America*
[63] *Department of Physics and Astronomy, Iowa State University, Ames IA, United States of America*
[64] *Joint Institute for Nuclear Research, JINR Dubna, Dubna, Russia*
[65] *KEK, High Energy Accelerator Research Organization, Tsukuba, Japan*
[66] *Graduate School of Science, Kobe University, Kobe, Japan*
[67] *Faculty of Science, Kyoto University, Kyoto, Japan*
[68] *Kyoto University of Education, Kyoto, Japan*
[69] *Department of Physics, Kyushu University, Fukuoka, Japan*
[70] *Instituto de Física La Plata, Universidad Nacional de La Plata and CONICET, La Plata, Argentina*
[71] *Physics Department, Lancaster University, Lancaster, United Kingdom*
[72] [(a)] *INFN Sezione di Lecce;* [(b)] *Dipartimento di Matematica e Fisica, Università del Salento, Lecce, Italy*
[73] *Oliver Lodge Laboratory, University of Liverpool, Liverpool, United Kingdom*
[74] *Department of Physics, Jožef Stefan Institute and University of Ljubljana, Ljubljana, Slovenia*
[75] *School of Physics and Astronomy, Queen Mary University of London, London, United Kingdom*
[76] *Department of Physics, Royal Holloway University of London, Surrey, United Kingdom*
[77] *Department of Physics and Astronomy, University College London, London, United Kingdom*
[78] *Louisiana Tech University, Ruston LA, United States of America*
[79] *Laboratoire de Physique Nucléaire et de Hautes Energies, UPMC and Université Paris-Diderot and CNRS/IN2P3, Paris, France*
[80] *Fysiska institutionen, Lunds universitet, Lund, Sweden*
[81] *Departamento de Fisica Teorica C-15, Universidad Autonoma de Madrid, Madrid, Spain*
[82] *Institut für Physik, Universität Mainz, Mainz, Germany*
[83] *School of Physics and Astronomy, University of Manchester, Manchester, United Kingdom*
[84] *CPPM, Aix-Marseille Université and CNRS/IN2P3, Marseille, France*
[85] *Department of Physics, University of Massachusetts, Amherst MA, United States of America*
[86] *Department of Physics, McGill University, Montreal QC, Canada*
[87] *School of Physics, University of Melbourne, Victoria, Australia*
[88] *Department of Physics, The University of Michigan, Ann Arbor MI, United States of America*
[89] *Department of Physics and Astronomy, Michigan State University, East Lansing MI, United States of America*
[90] [(a)] *INFN Sezione di Milano;* [(b)] *Dipartimento di Fisica, Università di Milano, Milano, Italy*
[91] *B.I. Stepanov Institute of Physics, National Academy of Sciences of Belarus, Minsk, Republic of Belarus*
[92] *National Scientific and Educational Centre for Particle and High Energy Physics, Minsk, Republic of Belarus*
[93] *Department of Physics, Massachusetts Institute of Technology, Cambridge MA, United States of America*
[94] *Group of Particle Physics, University of Montreal, Montreal QC, Canada*
[95] *P.N. Lebedev Institute of Physics, Academy of Sciences, Moscow, Russia*
[96] *Institute for Theoretical and Experimental Physics (ITEP), Moscow, Russia*
[97] *Moscow Engineering and Physics Institute (MEPhI), Moscow, Russia*
[98] *D.V.Skobeltsyn Institute of Nuclear Physics, M.V.Lomonosov Moscow State University, Moscow, Russia*
[99] *Fakultät für Physik, Ludwig-Maximilians-Universität München, München, Germany*
[100] *Max-Planck-Institut für Physik (Werner-Heisenberg-Institut), München, Germany*
[101] *Nagasaki Institute of Applied Science, Nagasaki, Japan*
[102] *Graduate School of Science and Kobayashi-Maskawa Institute, Nagoya University, Nagoya, Japan*
[103] [(a)] *INFN Sezione di Napoli;* [(b)] *Dipartimento di Fisica, Università di Napoli, Napoli, Italy*
[104] *Department of Physics and Astronomy, University of New Mexico, Albuquerque NM, United States of America*
[105] *Institute for Mathematics, Astrophysics and Particle Physics, Radboud University Nijmegen/Nikhef, Nijmegen, Netherlands*

JHEP09(2015)141

[106] Nikhef National Institute for Subatomic Physics and University of Amsterdam, Amsterdam, Netherlands
[107] Department of Physics, Northern Illinois University, DeKalb IL, United States of America
[108] Budker Institute of Nuclear Physics, SB RAS, Novosibirsk, Russia
[109] Department of Physics, New York University, New York NY, United States of America
[110] Ohio State University, Columbus OH, United States of America
[111] Faculty of Science, Okayama University, Okayama, Japan
[112] Homer L. Dodge Department of Physics and Astronomy, University of Oklahoma, Norman OK, United States of America
[113] Department of Physics, Oklahoma State University, Stillwater OK, United States of America
[114] Palacký University, RCPTM, Olomouc, Czech Republic
[115] Center for High Energy Physics, University of Oregon, Eugene OR, United States of America
[116] LAL, Université Paris-Sud and CNRS/IN2P3, Orsay, France
[117] Graduate School of Science, Osaka University, Osaka, Japan
[118] Department of Physics, University of Oslo, Oslo, Norway
[119] Department of Physics, Oxford University, Oxford, United Kingdom
[120] [(a)] INFN Sezione di Pavia; [(b)] Dipartimento di Fisica, Università di Pavia, Pavia, Italy
[121] Department of Physics, University of Pennsylvania, Philadelphia PA, United States of America
[122] Petersburg Nuclear Physics Institute, Gatchina, Russia
[123] [(a)] INFN Sezione di Pisa; [(b)] Dipartimento di Fisica E. Fermi, Università di Pisa, Pisa, Italy
[124] Department of Physics and Astronomy, University of Pittsburgh, Pittsburgh PA, United States of America
[125] [(a)] Laboratorio de Instrumentacao e Fisica Experimental de Particulas - LIP, Lisboa; [(b)] Faculdade de Ciências, Universidade de Lisboa, Lisboa; [(c)] Department of Physics, University of Coimbra, Coimbra; [(d)] Centro de Física Nuclear da Universidade de Lisboa, Lisboa; [(e)] Departamento de Fisica, Universidade do Minho, Braga; [(f)] Departamento de Fisica Teorica y del Cosmos and CAFPE, Universidad de Granada, Granada (Spain); [(g)] Dep Fisica and CEFITEC of Faculdade de Ciencias e Tecnologia, Universidade Nova de Lisboa, Caparica, Portugal
[126] Institute of Physics, Academy of Sciences of the Czech Republic, Praha, Czech Republic
[127] Czech Technical University in Prague, Praha, Czech Republic
[128] Faculty of Mathematics and Physics, Charles University in Prague, Praha, Czech Republic
[129] State Research Center Institute for High Energy Physics, Protvino, Russia
[130] Particle Physics Department, Rutherford Appleton Laboratory, Didcot, United Kingdom
[131] Physics Department, University of Regina, Regina SK, Canada
[132] Ritsumeikan University, Kusatsu, Shiga, Japan
[133] [(a)] INFN Sezione di Roma; [(b)] Dipartimento di Fisica, Sapienza Università di Roma, Roma, Italy
[134] [(a)] INFN Sezione di Roma Tor Vergata; [(b)] Dipartimento di Fisica, Università di Roma Tor Vergata, Roma, Italy
[135] [(a)] INFN Sezione di Roma Tre; [(b)] Dipartimento di Matematica e Fisica, Università Roma Tre, Roma, Italy
[136] [(a)] Faculté des Sciences Ain Chock, Réseau Universitaire de Physique des Hautes Energies - Université Hassan II, Casablanca; [(b)] Centre National de l'Energie des Sciences Techniques Nucleaires, Rabat; [(c)] Faculté des Sciences Semlalia, Université Cadi Ayyad, LPHEA-Marrakech; [(d)] Faculté des Sciences, Université Mohamed Premier and LPTPM, Oujda; [(e)] Faculté des sciences, Université Mohammed V-Agdal, Rabat, Morocco
[137] DSM/IRFU (Institut de Recherches sur les Lois Fondamentales de l'Univers), CEA Saclay (Commissariat à l'Energie Atomique et aux Energies Alternatives), Gif-sur-Yvette, France
[138] Santa Cruz Institute for Particle Physics, University of California Santa Cruz, Santa Cruz CA, United States of America
[139] Department of Physics, University of Washington, Seattle WA, United States of America
[140] Department of Physics and Astronomy, University of Sheffield, Sheffield, United Kingdom
[141] Department of Physics, Shinshu University, Nagano, Japan
[142] Fachbereich Physik, Universität Siegen, Siegen, Germany

[143] *Department of Physics, Simon Fraser University, Burnaby BC, Canada*
[144] *SLAC National Accelerator Laboratory, Stanford CA, United States of America*
[145] [(a)] *Faculty of Mathematics, Physics & Informatics, Comenius University, Bratislava;* [(b)] *Department of Subnuclear Physics, Institute of Experimental Physics of the Slovak Academy of Sciences, Kosice, Slovak Republic*
[146] [(a)] *Department of Physics, University of Cape Town, Cape Town;* [(b)] *Department of Physics, University of Johannesburg, Johannesburg;* [(c)] *School of Physics, University of the Witwatersrand, Johannesburg, South Africa*
[147] [(a)] *Department of Physics, Stockholm University;* [(b)] *The Oskar Klein Centre, Stockholm, Sweden*
[148] *Physics Department, Royal Institute of Technology, Stockholm, Sweden*
[149] *Departments of Physics & Astronomy and Chemistry, Stony Brook University, Stony Brook NY, United States of America*
[150] *Department of Physics and Astronomy, University of Sussex, Brighton, United Kingdom*
[151] *School of Physics, University of Sydney, Sydney, Australia*
[152] *Institute of Physics, Academia Sinica, Taipei, Taiwan*
[153] *Department of Physics, Technion: Israel Institute of Technology, Haifa, Israel*
[154] *Raymond and Beverly Sackler School of Physics and Astronomy, Tel Aviv University, Tel Aviv, Israel*
[155] *Department of Physics, Aristotle University of Thessaloniki, Thessaloniki, Greece*
[156] *International Center for Elementary Particle Physics and Department of Physics, The University of Tokyo, Tokyo, Japan*
[157] *Graduate School of Science and Technology, Tokyo Metropolitan University, Tokyo, Japan*
[158] *Department of Physics, Tokyo Institute of Technology, Tokyo, Japan*
[159] *Department of Physics, University of Toronto, Toronto ON, Canada*
[160] [(a)] *TRIUMF, Vancouver BC;* [(b)] *Department of Physics and Astronomy, York University, Toronto ON, Canada*
[161] *Faculty of Pure and Applied Sciences, University of Tsukuba, Tsukuba, Japan*
[162] *Department of Physics and Astronomy, Tufts University, Medford MA, United States of America*
[163] *Centro de Investigaciones, Universidad Antonio Narino, Bogota, Colombia*
[164] *Department of Physics and Astronomy, University of California Irvine, Irvine CA, United States of America*
[165] [(a)] *INFN Gruppo Collegato di Udine, Sezione di Trieste, Udine;* [(b)] *ICTP, Trieste;* [(c)] *Dipartimento di Chimica, Fisica e Ambiente, Università di Udine, Udine, Italy*
[166] *Department of Physics, University of Illinois, Urbana IL, United States of America*
[167] *Department of Physics and Astronomy, University of Uppsala, Uppsala, Sweden*
[168] *Instituto de Física Corpuscular (IFIC) and Departamento de Física Atómica, Molecular y Nuclear and Departamento de Ingeniería Electrónica and Instituto de Microelectrónica de Barcelona (IMB-CNM), University of Valencia and CSIC, Valencia, Spain*
[169] *Department of Physics, University of British Columbia, Vancouver BC, Canada*
[170] *Department of Physics and Astronomy, University of Victoria, Victoria BC, Canada*
[171] *Department of Physics, University of Warwick, Coventry, United Kingdom*
[172] *Waseda University, Tokyo, Japan*
[173] *Department of Particle Physics, The Weizmann Institute of Science, Rehovot, Israel*
[174] *Department of Physics, University of Wisconsin, Madison WI, United States of America*
[175] *Fakultät für Physik und Astronomie, Julius-Maximilians-Universität, Würzburg, Germany*
[176] *Fachbereich C Physik, Bergische Universität Wuppertal, Wuppertal, Germany*
[177] *Department of Physics, Yale University, New Haven CT, United States of America*
[178] *Yerevan Physics Institute, Yerevan, Armenia*
[179] *Centre de Calcul de l'Institut National de Physique Nucléaire et de Physique des Particules (IN2P3), Villeurbanne, France*
[a] *Also at Department of Physics, King's College London, London, United Kingdom*
[b] *Also at Institute of Physics, Azerbaijan Academy of Sciences, Baku, Azerbaijan*
[c] *Also at Particle Physics Department, Rutherford Appleton Laboratory, Didcot, United Kingdom*

JHEP09(2015)141

[d] *Also at TRIUMF, Vancouver BC, Canada*
[e] *Also at Department of Physics, California State University, Fresno CA, United States of America*
[f] *Also at Tomsk State University, Tomsk, Russia*
[g] *Also at CPPM, Aix-Marseille Université and CNRS/IN2P3, Marseille, France*
[h] *Also at Università di Napoli Parthenope, Napoli, Italy*
[i] *Also at Institute of Particle Physics (IPP), Canada*
[j] *Also at Department of Physics, St. Petersburg State Polytechnical University, St. Petersburg, Russia*
[k] *Also at Chinese University of Hong Kong, China*
[l] *Also at Department of Financial and Management Engineering, University of the Aegean, Chios, Greece*
[m] *Also at Louisiana Tech University, Ruston LA, United States of America*
[n] *Also at Institucio Catalana de Recerca i Estudis Avancats, ICREA, Barcelona, Spain*
[o] *Also at Department of Physics, The University of Texas at Austin, Austin TX, United States of America*
[p] *Also at Institute of Theoretical Physics, Ilia State University, Tbilisi, Georgia*
[q] *Also at CERN, Geneva, Switzerland*
[r] *Also at Ochadai Academic Production, Ochanomizu University, Tokyo, Japan*
[s] *Also at Manhattan College, New York NY, United States of America*
[t] *Also at Novosibirsk State University, Novosibirsk, Russia*
[u] *Also at Institute of Physics, Academia Sinica, Taipei, Taiwan*
[v] *Also at LAL, Université Paris-Sud and CNRS/IN2P3, Orsay, France*
[w] *Also at Academia Sinica Grid Computing, Institute of Physics, Academia Sinica, Taipei, Taiwan*
[x] *Also at Laboratoire de Physique Nucléaire et de Hautes Energies, UPMC and Université Paris-Diderot and CNRS/IN2P3, Paris, France*
[y] *Also at School of Physical Sciences, National Institute of Science Education and Research, Bhubaneswar, India*
[z] *Also at Dipartimento di Fisica, Sapienza Università di Roma, Roma, Italy*
[aa] *Also at Moscow Institute of Physics and Technology State University, Dolgoprudny, Russia*
[ab] *Also at Section de Physique, Université de Genève, Geneva, Switzerland*
[ac] *Also at International School for Advanced Studies (SISSA), Trieste, Italy*
[ad] *Also at Department of Physics and Astronomy, University of South Carolina, Columbia SC, United States of America*
[ae] *Also at School of Physics and Engineering, Sun Yat-sen University, Guangzhou, China*
[af] *Also at Faculty of Physics, M.V.Lomonosov Moscow State University, Moscow, Russia*
[ag] *Also at Moscow Engineering and Physics Institute (MEPhI), Moscow, Russia*
[ah] *Also at Institute for Particle and Nuclear Physics, Wigner Research Centre for Physics, Budapest, Hungary*
[ai] *Also at Department of Physics, Oxford University, Oxford, United Kingdom*
[aj] *Also at Department of Physics, Nanjing University, Jiangsu, China*
[ak] *Also at Institut für Experimentalphysik, Universität Hamburg, Hamburg, Germany*
[al] *Also at Department of Physics, The University of Michigan, Ann Arbor MI, United States of America*
[am] *Also at Discipline of Physics, University of KwaZulu-Natal, Durban, South Africa*
[an] *Also at University of Malaya, Department of Physics, Kuala Lumpur, Malaysia*
[*] *Deceased*

JHEP09(2015)141