Review of LHC results on B and D production

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SM@LHC 2011, Durham, Flavour @ LHC 13/04/11

B And D Production at LHC

Test the predictions of QCD at leading and higher orders

Early measurements at LHC can have smaller uncertainties than NLO QCD predictions

Useful to estimate an experiment's sensitivity for CP violation, mixing and rare decays

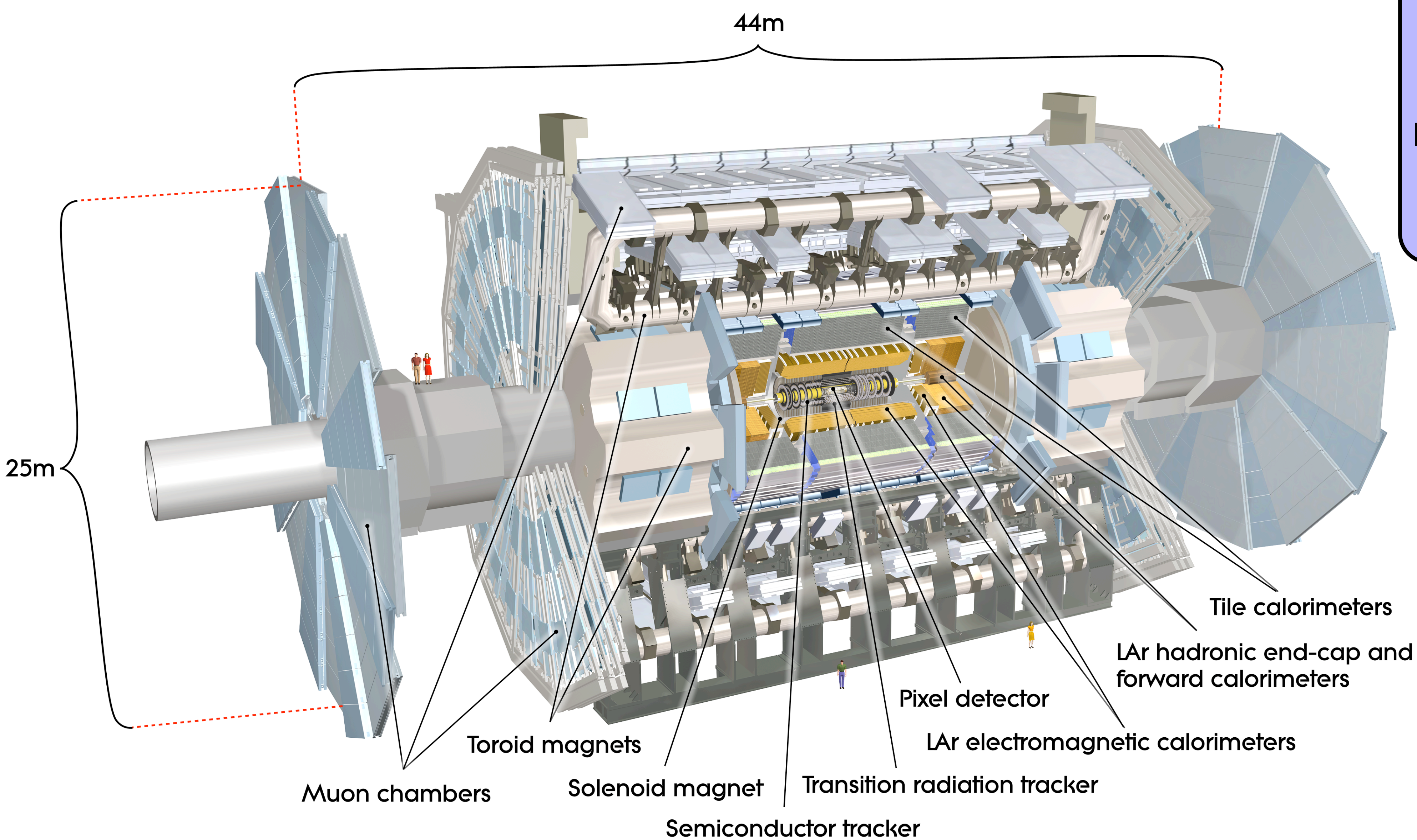
Understand background in searches for new physics

B-tagging is an important signature in many analyses

Detector performance studies, alignment, validation of tracking and muon systems

$b \to J/\psi X$ covered by Andrea Coccaro (next talk)

The ATLAS Detector



Muon Spectrometer:
$|\eta| < 2.7$
air core toroids(average 0.5T)
gas-based muon chambers
Muon trigger and reconstruction
Momentum resolution < 10%
$up\ to\ E(\mu) \sim 1\ TeV$

3-level trigger, reducing the rate from 40 MHz to ~200 Hz

EM Calorimeter:
Pb-LAr accordion
e/γ trigger, identification and measurement
Resolution:
$$\sigma/E \sim 10\%/\sqrt{E}$$

Inner Detector:
Si Pixels, Si Strips, TRT straws
Precise tracking and vertexing
pT resolution:
$$\sigma/p_T \sim 3.8 \times 10^{-4}\ p_T(GeV) \oplus 0.015$$
$$|\eta| < 2.5,\ \ B = 2T$$

HAD Calorimetry:
$|\eta| < 5$
Fe/scintillator tiles (central), Cu/W-LAr (fwd)
Trigger and measurement of jets and MET
Resolution:
$$\sigma/E \sim 50\%/\sqrt{E} \oplus 0.03$$

The CMS Detector

Superconducting Coil

4 Tesla B field

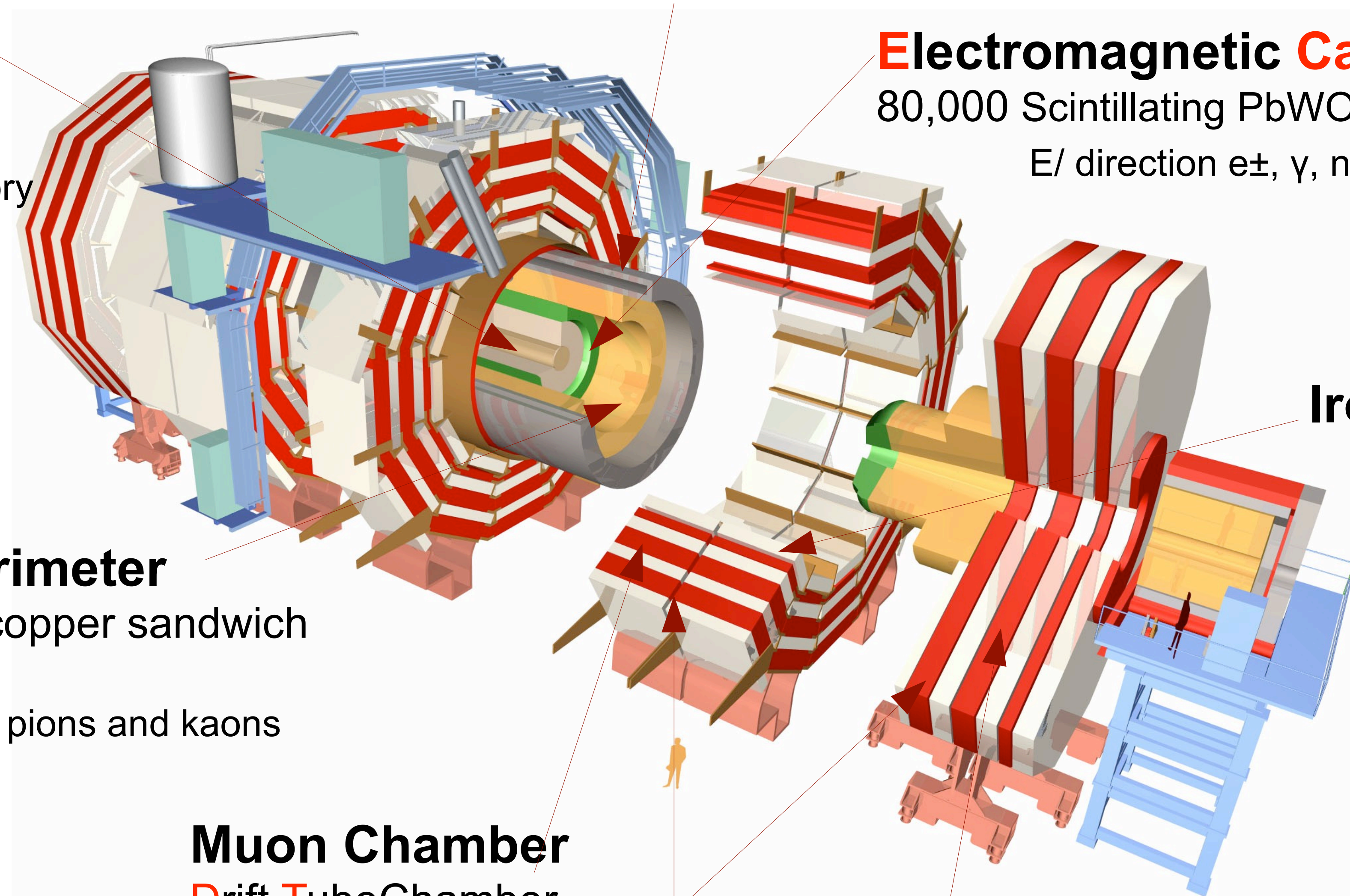
bend the paths of particles
compact design led to the detector's name

Trackers

1M Silicon strips,
66M silicon pixels

charged particle
vertex and trajectory

$|\eta| < 2.4$



Electromagnetic Calorimeter

80,000 Scintillating $PbWO_4$ crystals

E/ direction e±, γ, neutral hadron ID

Iron yoke

Hadronic Calorimeter

Plastic scintillator copper sandwich

energy of hadrons
protons, neutrons, pions and kaons

Muon Chamber

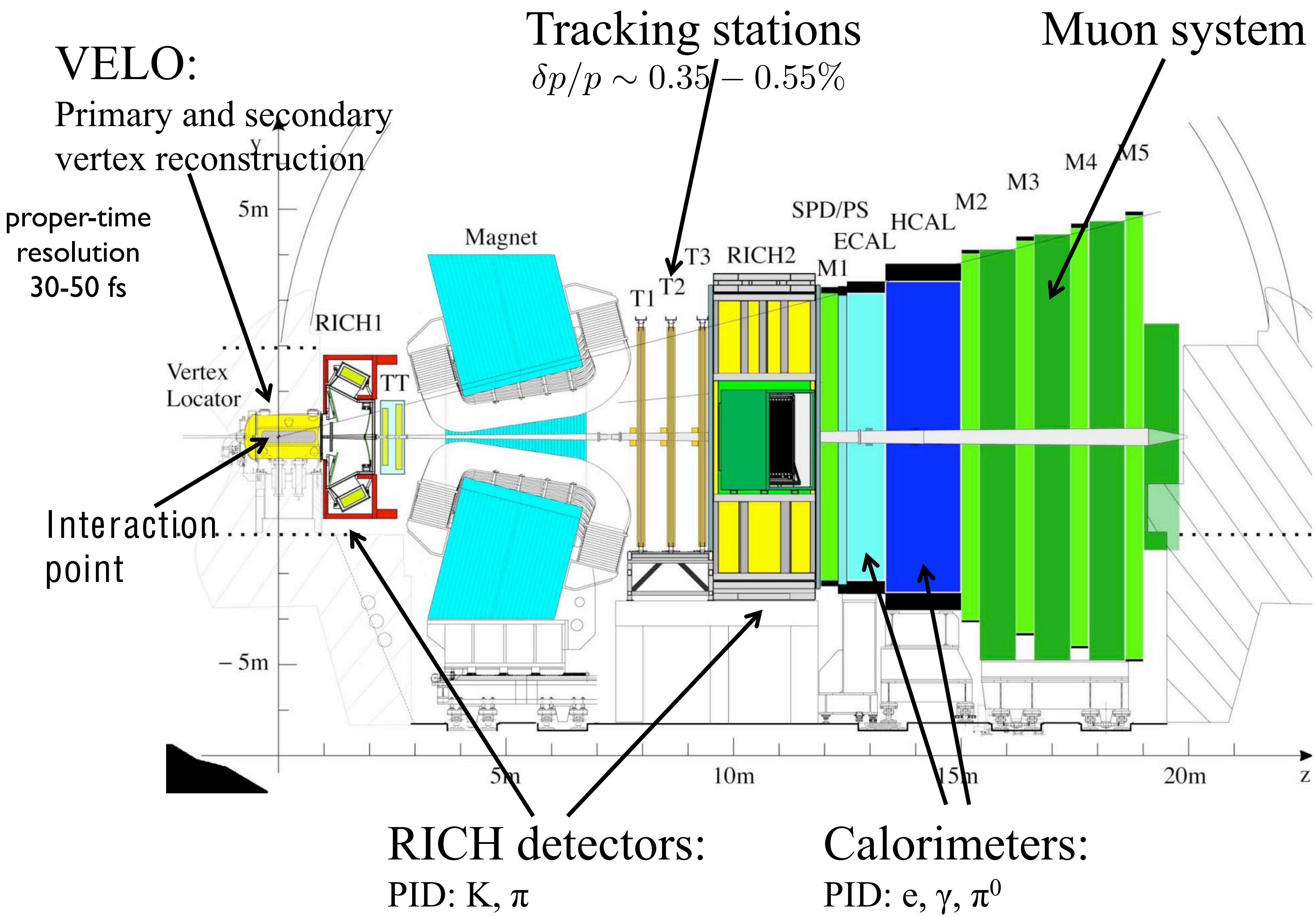
Drift TubeChamber,
Resistive Plate Chambers,
Cathode Strip Chambers

$|\eta| < 2.4$

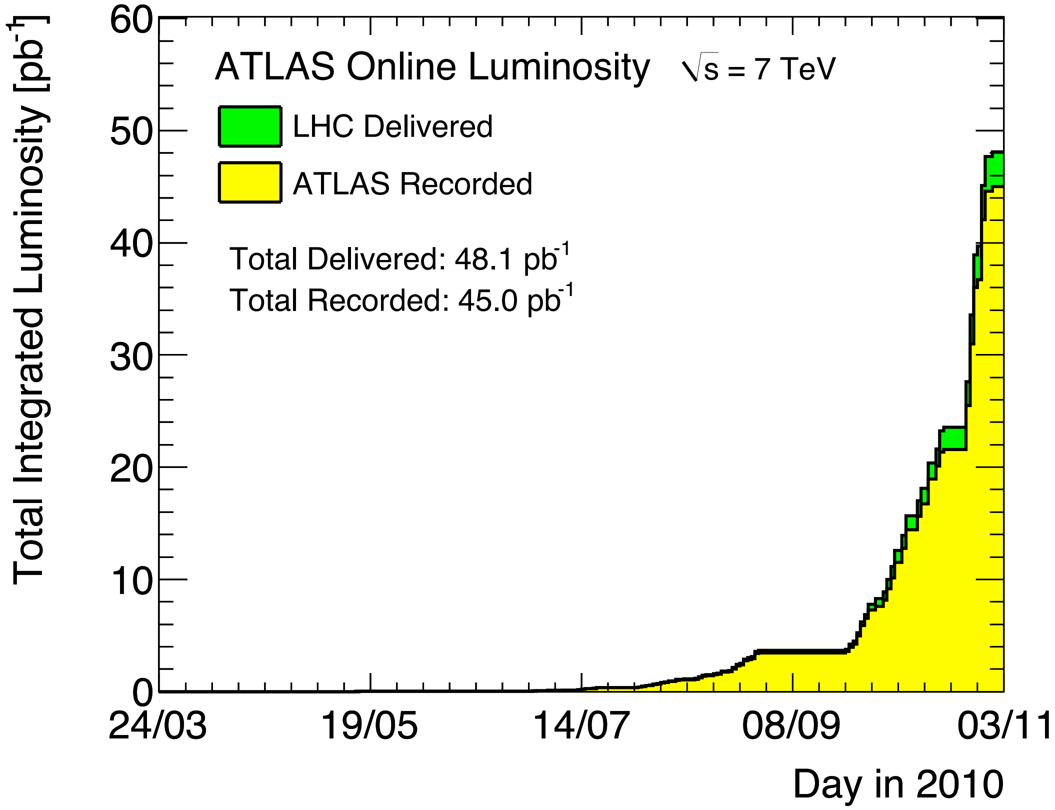
The LHCb Detector

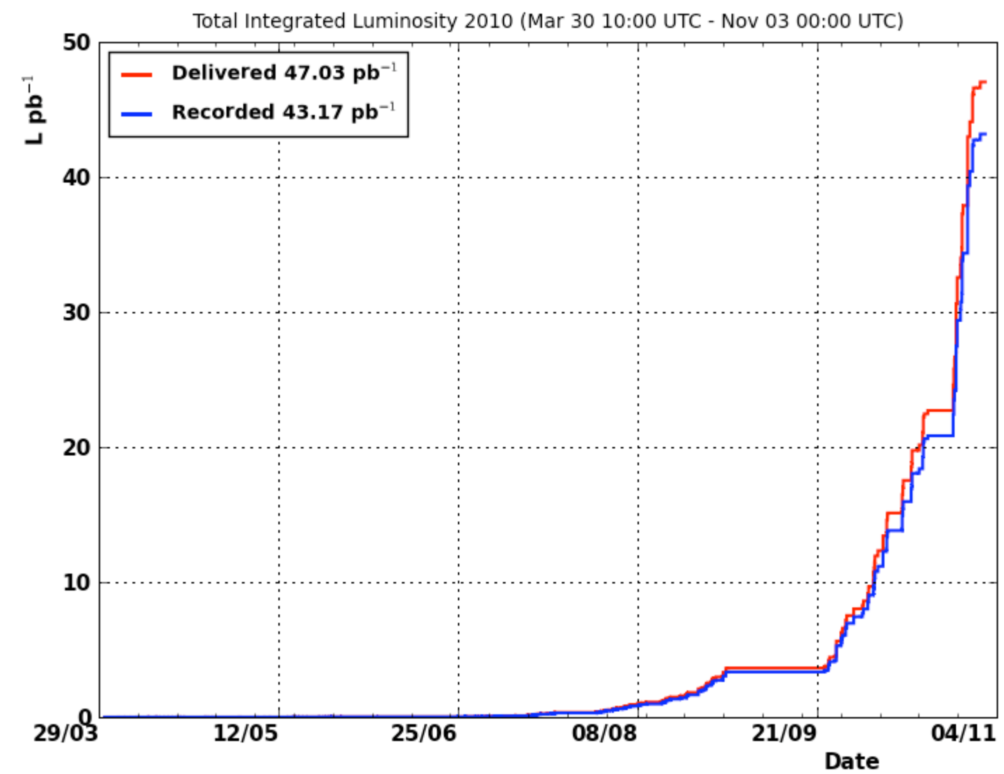
Forward spectrometer

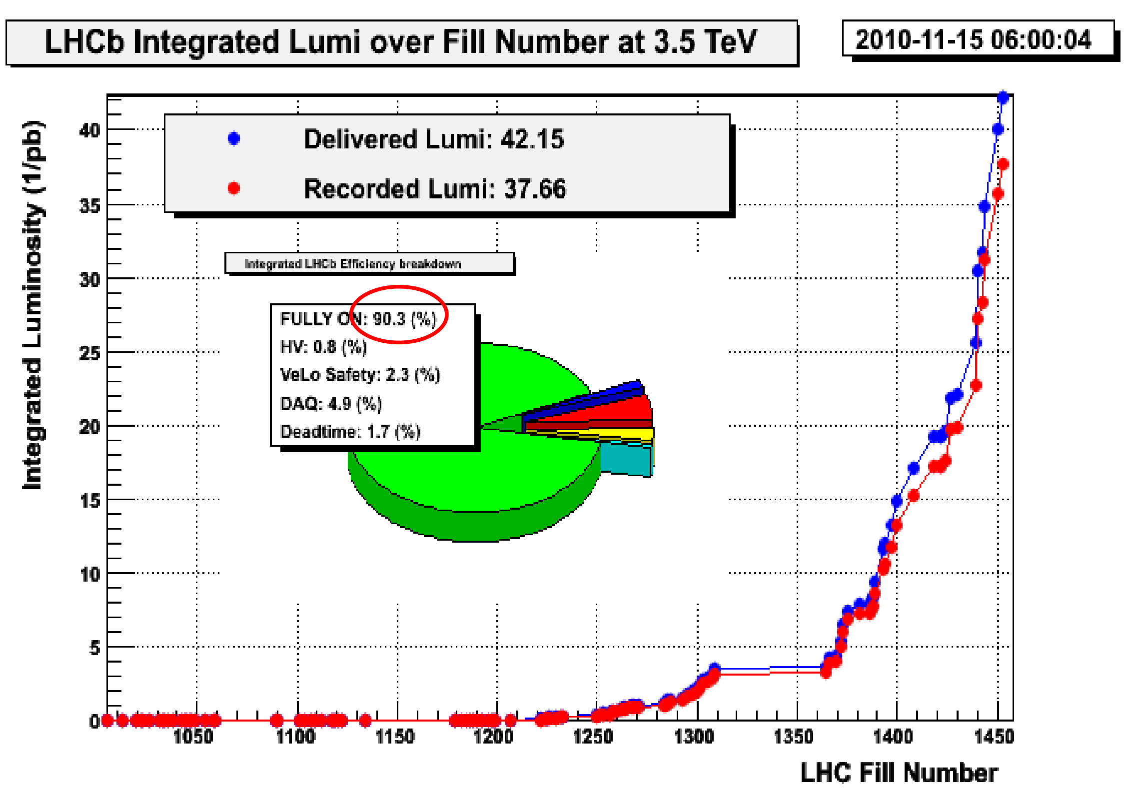
$2 < \eta < 5.3$



Luminosity And Data Taking $\sqrt{s} = 7\ TeV$







Systematic uncertainties from luminosity measurement:

LHCb: 10% CMS: 11% ATLAS: 11%

New systematics evaluation:

LHCb: 3.5% CMS: 4% ATLAS: 3.2%

Open Charm Production - LHCb And ATLAS

Cross-sections obtained from fully reconstructed decays of

$$D^0,\ D^{\pm},\ D^{*\pm}\ and\ D_s^{*\pm}$$

Yields measured for each decay mode in bins of pT and rapidity with fits to the reconstructed invariant mass distributions

Discriminate between prompt and secondary D mesons

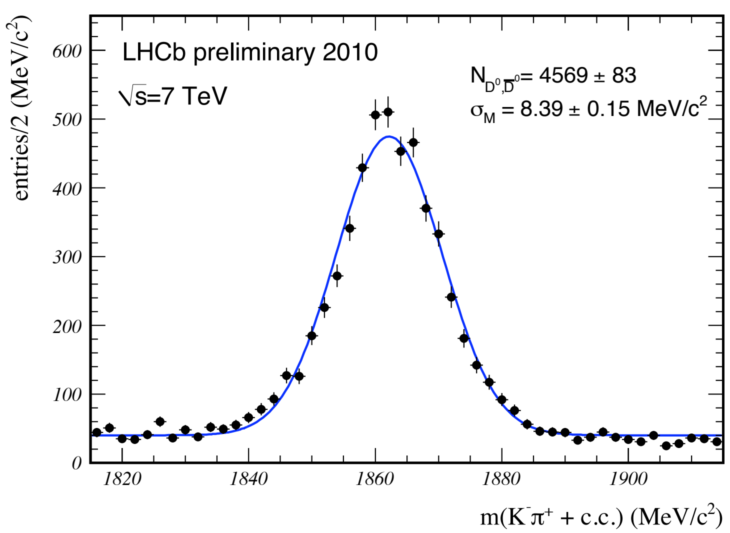
Efficiencies from MC studies and data studies

Measured cross-sections compared to theoretical predictions and extrapolated to full phase space

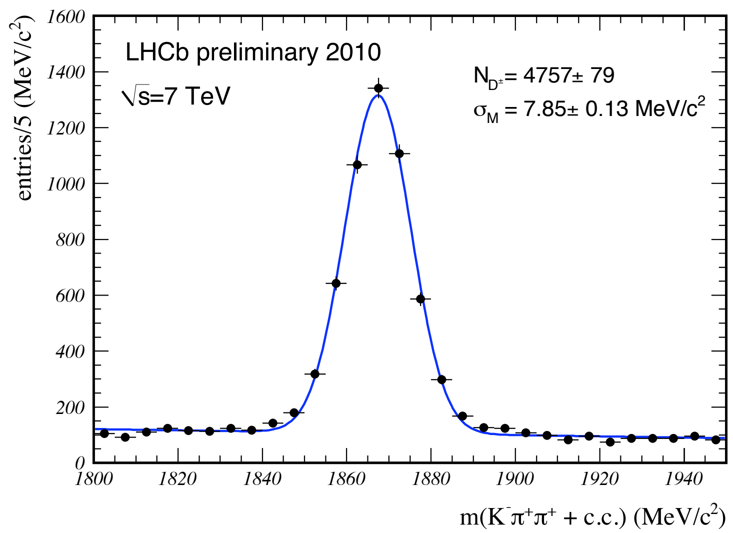
Open charm production (LHCb)

$0 < p_T < 8\ GeV$ $2 < y < 4.5$ $\mathcal{L} = 1.81\ nb^{-1}$

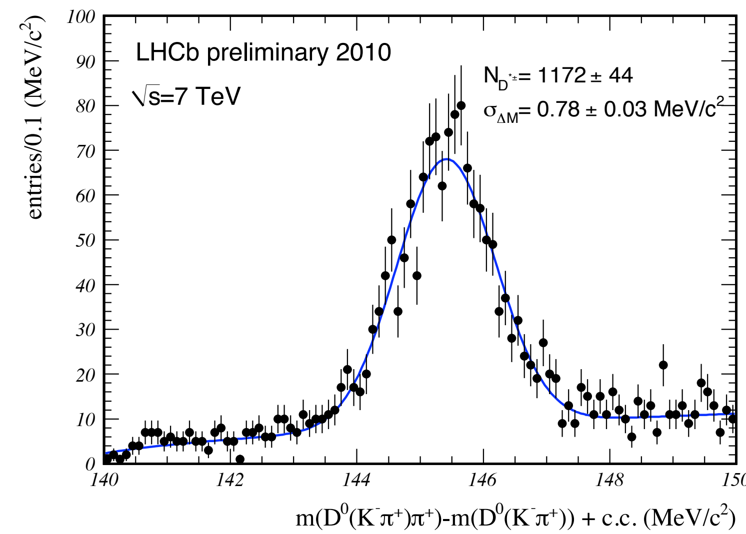
$D^0 \to K^-\pi^+$



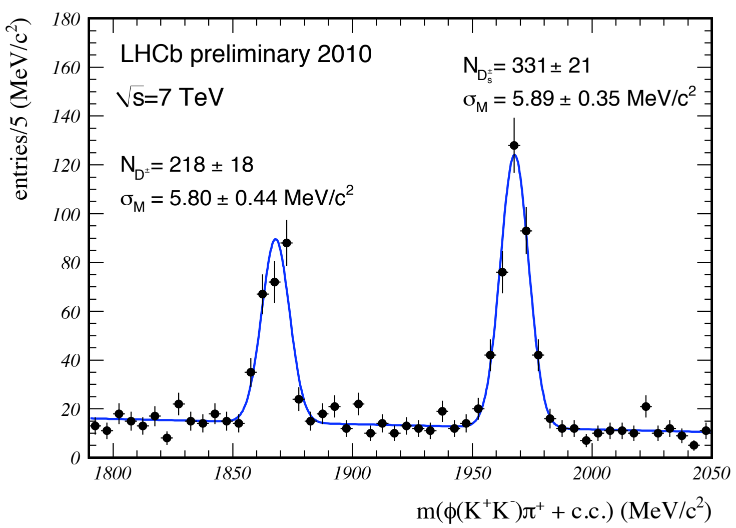
$D^+ \to K^-\pi^+\pi^+$



$D^{*+} \to \pi^+ D^0(K^-\pi^+)$



$D^+_{(s)} \to \phi(K^-K^+)\pi^+$



Trigger: events with minimal observable activity

Mass distributions determine D background fraction,
ln(IP) used to determine background from B decays

Results compared to theoretical predictions:

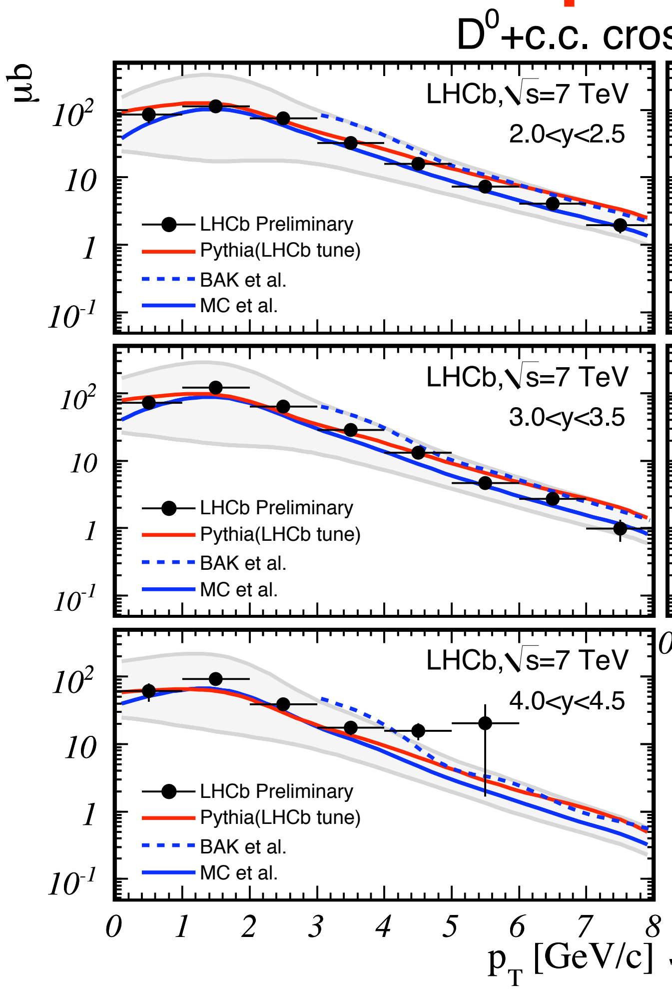
PYTHIA: LHCb tune

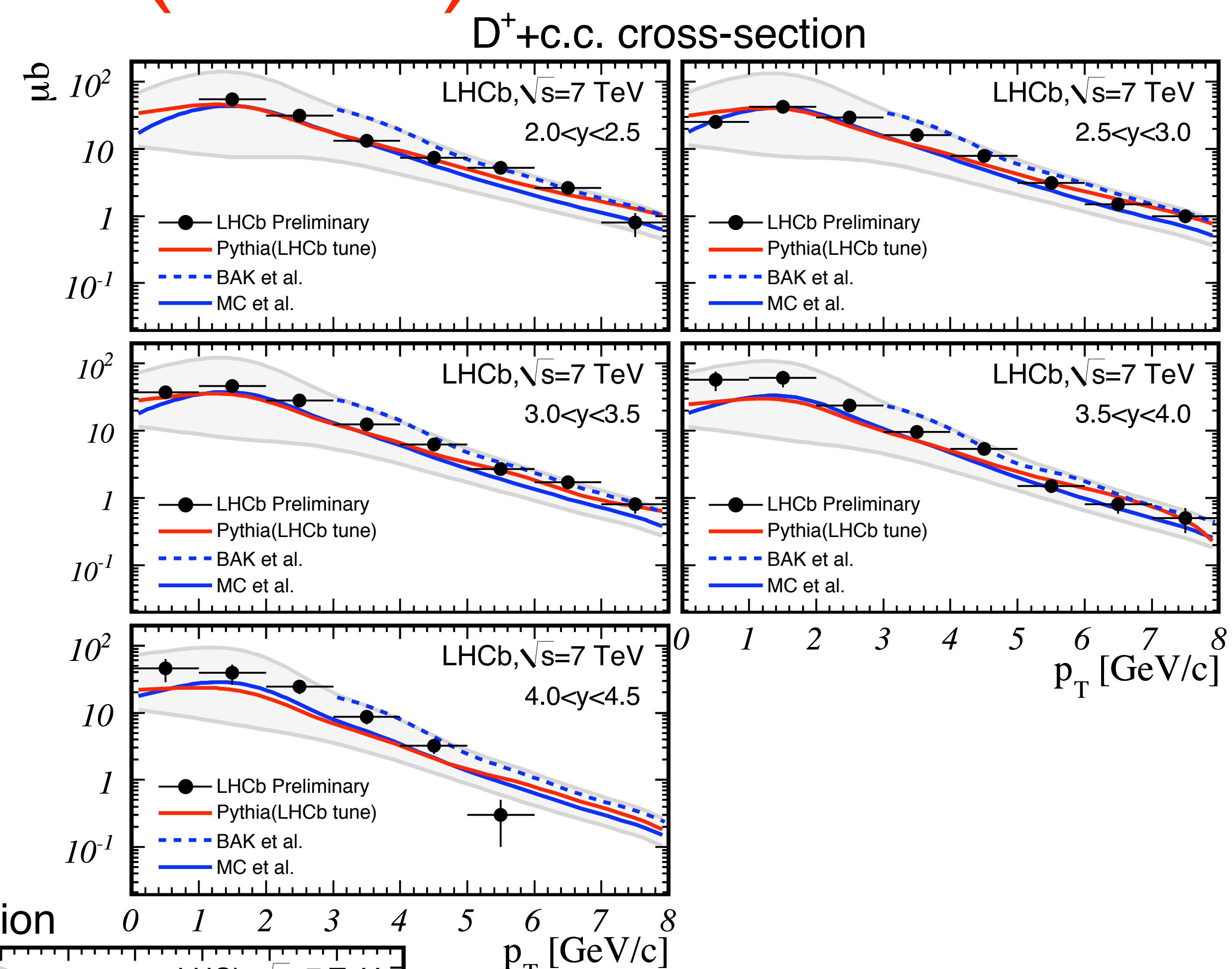
BAK et al: B.A.Kniehl, G.Kramer, I.Schiembein, H.Spiesberger

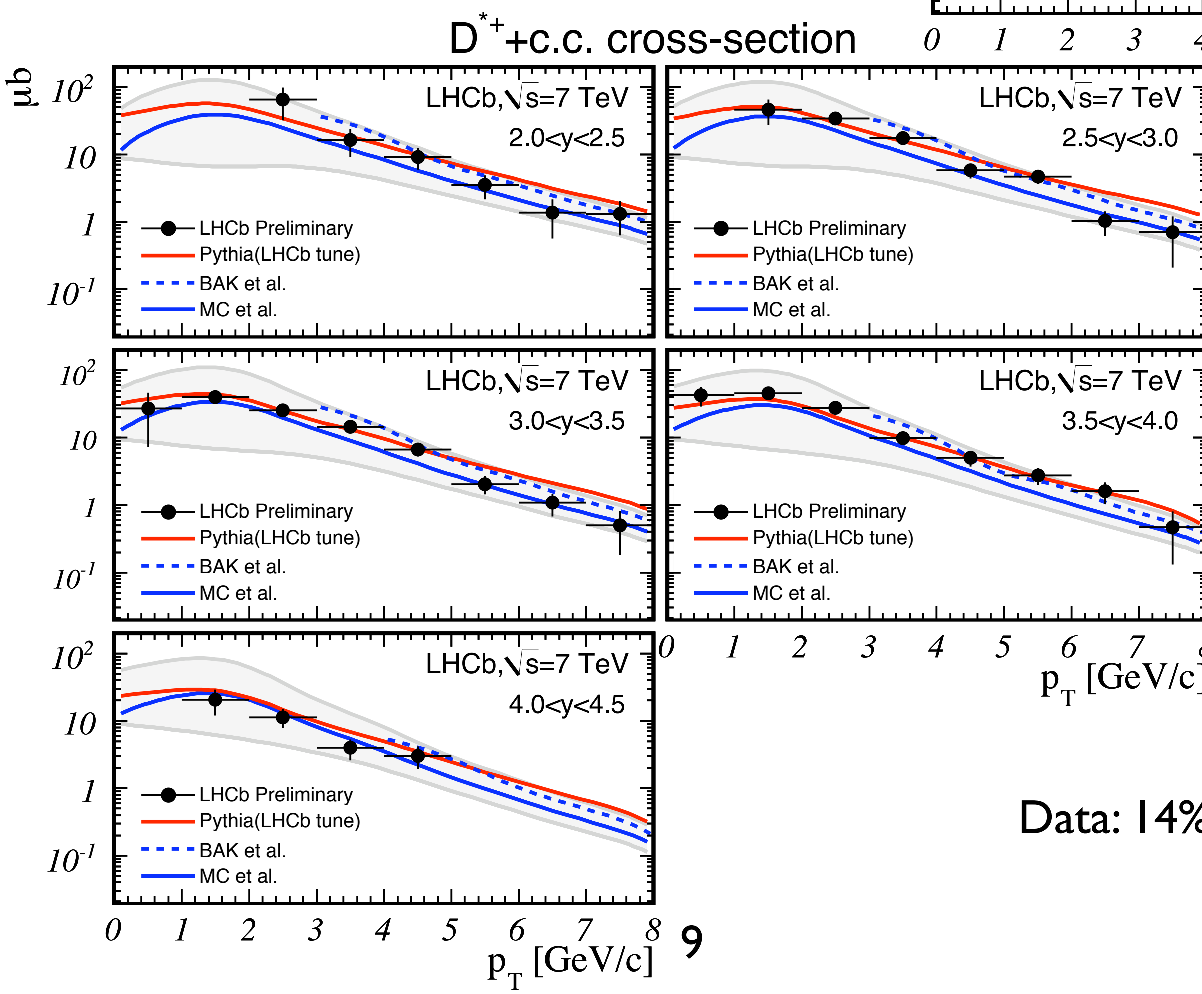
MC et al (aka FONLL): M.Cacciari, S.Frixione, M.Mangano, M.Nason, G.Ridolf

LHCb-CONF-2010-013

Open charm production (LHCb)







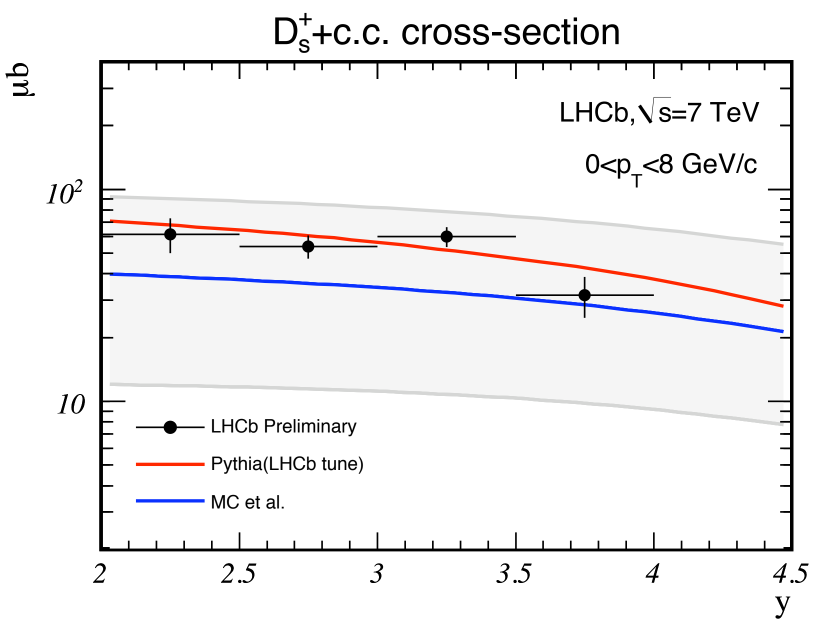
$0 < p_T < 8\ GeV$

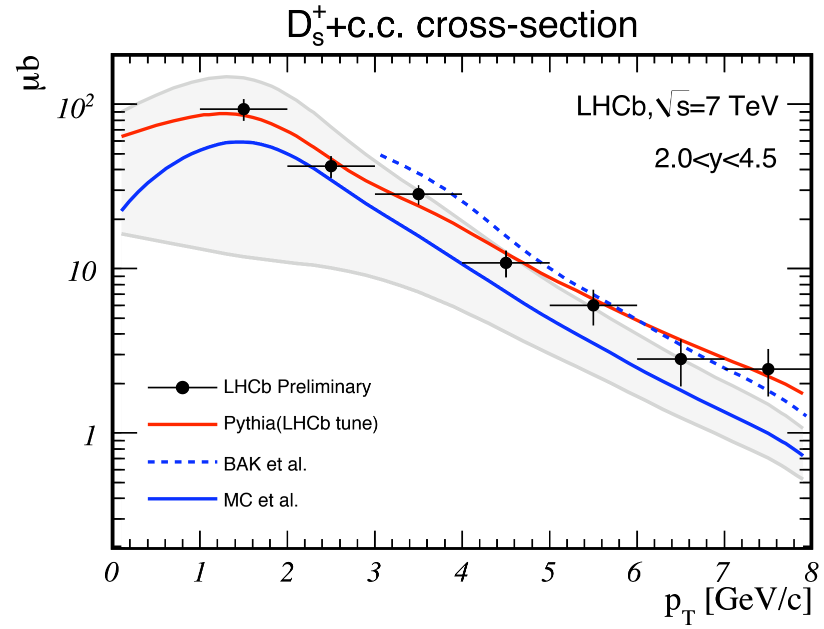
$2 < y < 4.5$

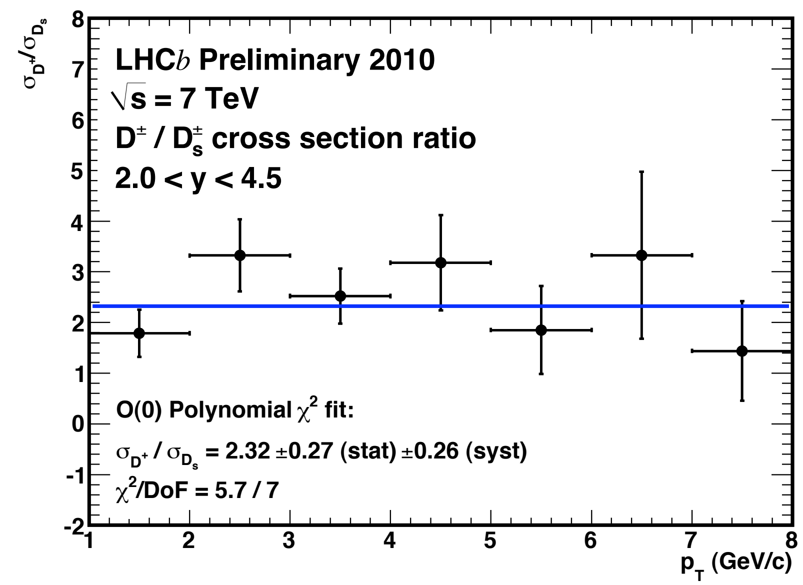
- LHCb Preliminary
- Pythia(LHCb tune)
- BAK et al.
- MC et al.

Data: 14% correlated error not shown

Open charm production (LHCb)







Data: 16% correlated error not shown

$$\sigma(D^+)/\sigma(D_s^+) = 2.32 \pm 0.27 \pm 0.26$$

To leading order $f(c \to D^+)/f(c \to D_s^+) = 3.08 \pm 0.70$ (PDG)

$$\begin{aligned}
\sigma(D^0) &= 1488 \pm 41 \pm 34 \pm 174\,\mu\text{b} = 1488 \pm 182\,\mu\text{b},\\
\sigma(D^{*+}) &= 676 \pm 64 \pm 21 \pm 119\,\mu\text{b} = 676 \pm 137\,\mu\text{b},\\
\sigma(D^+) &= 717 \pm 39 \pm 26 \pm 98\,\mu\text{b} = 717 \pm 109\,\mu\text{b},\\
\sigma(D_s^+) &= 194 \pm 23 \pm 16 \pm 26\,\mu\text{b} = 194 \pm 38\,\mu\text{b}.
\end{aligned}$$

$$\begin{aligned}
\sigma(c\bar{c}, D^0) &= 1280 \pm 36 \pm 151 \pm 150\,\mu\text{b} = 1280 \pm 216\,\mu\text{b},\\
\sigma(c\bar{c}, D^{*+}) &= 1474 \pm 140 \pm 176 \pm 260\,\mu\text{b} = 1474 \pm 343\,\mu\text{b},\\
\sigma(c\bar{c}, D^+) &= 1474 \pm 80 \pm 164 \pm 202\,\mu\text{b} = 1474 \pm 272\,\mu\text{b},\\
\sigma(c\bar{c}, D_s^+) &= 1092 \pm 130 \pm 151 \pm 147\,\mu\text{b} = 1092 \pm 247\,\mu\text{b}.
\end{aligned}$$

Combined average: $\sigma(c\bar{c})_y = 1234 \pm 189\ \mu b$

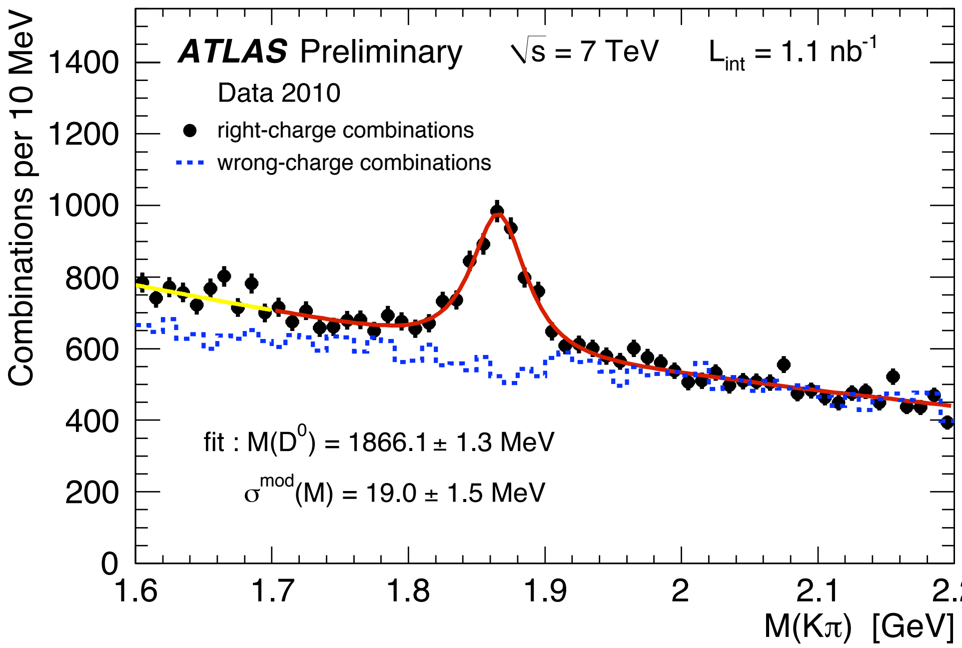
Using PYTHIA to extrapolate to full phase space:

$$\sigma(pp \to c\bar{c}X) = 6.10 \pm 0.93\ mb$$

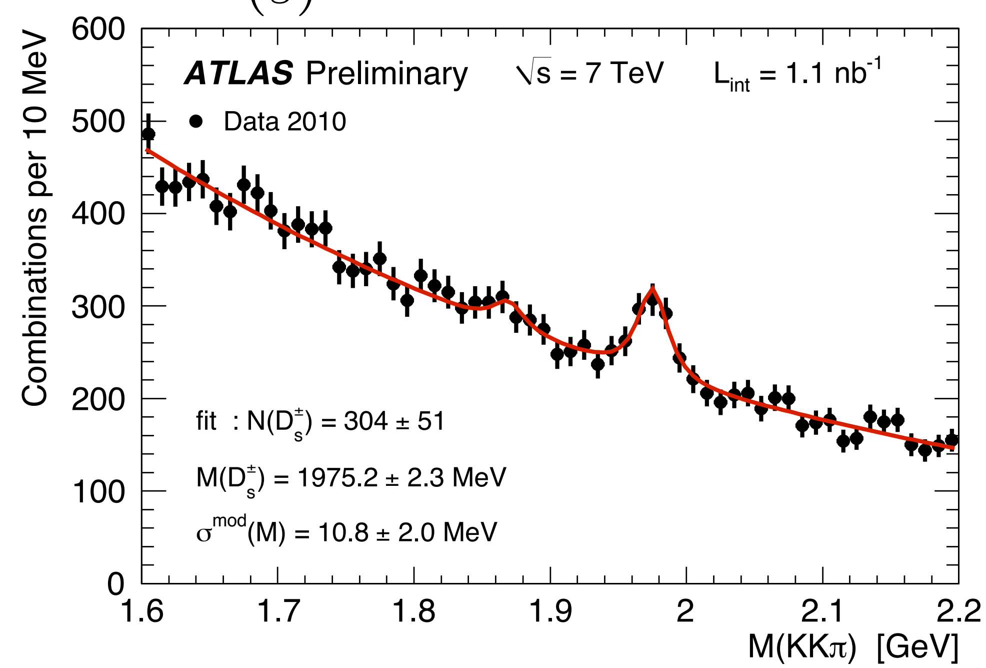
Open charm production (ATLAS)

$p_T > 3.5\ GeV$ $|\eta| < 2.1$ $\mathcal{L} = 1.1\ nb^{-1}$

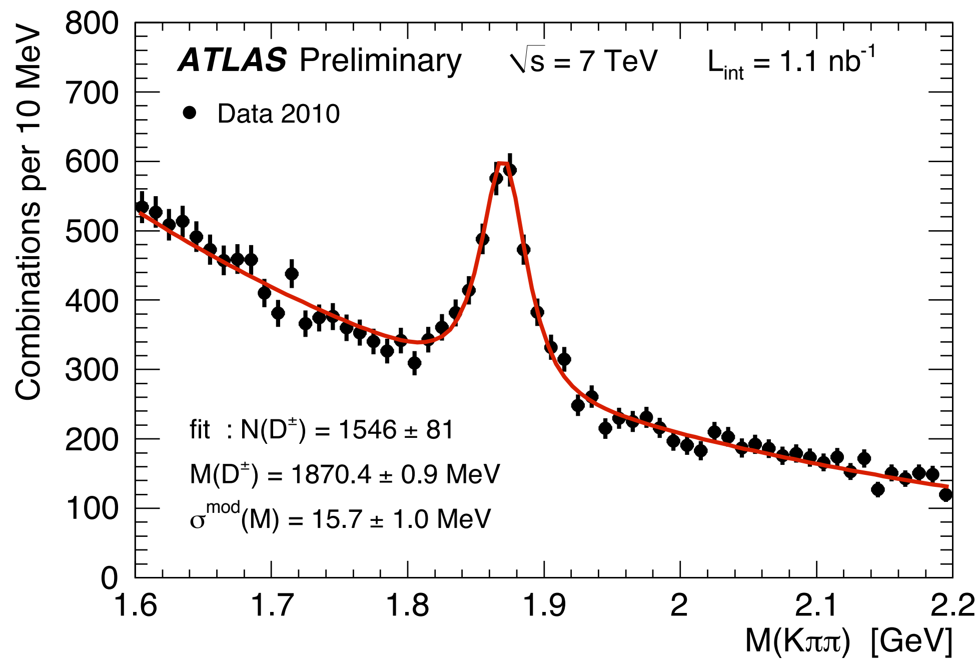
$D^0 \rightarrow K^-\pi^+$



$D^+_{(s)} \rightarrow \phi(K^-K^+)\pi^+$



$D^+ \rightarrow K^-\pi^+\pi^+$



Trigger: minimum bias (MBTS) plus random trigger

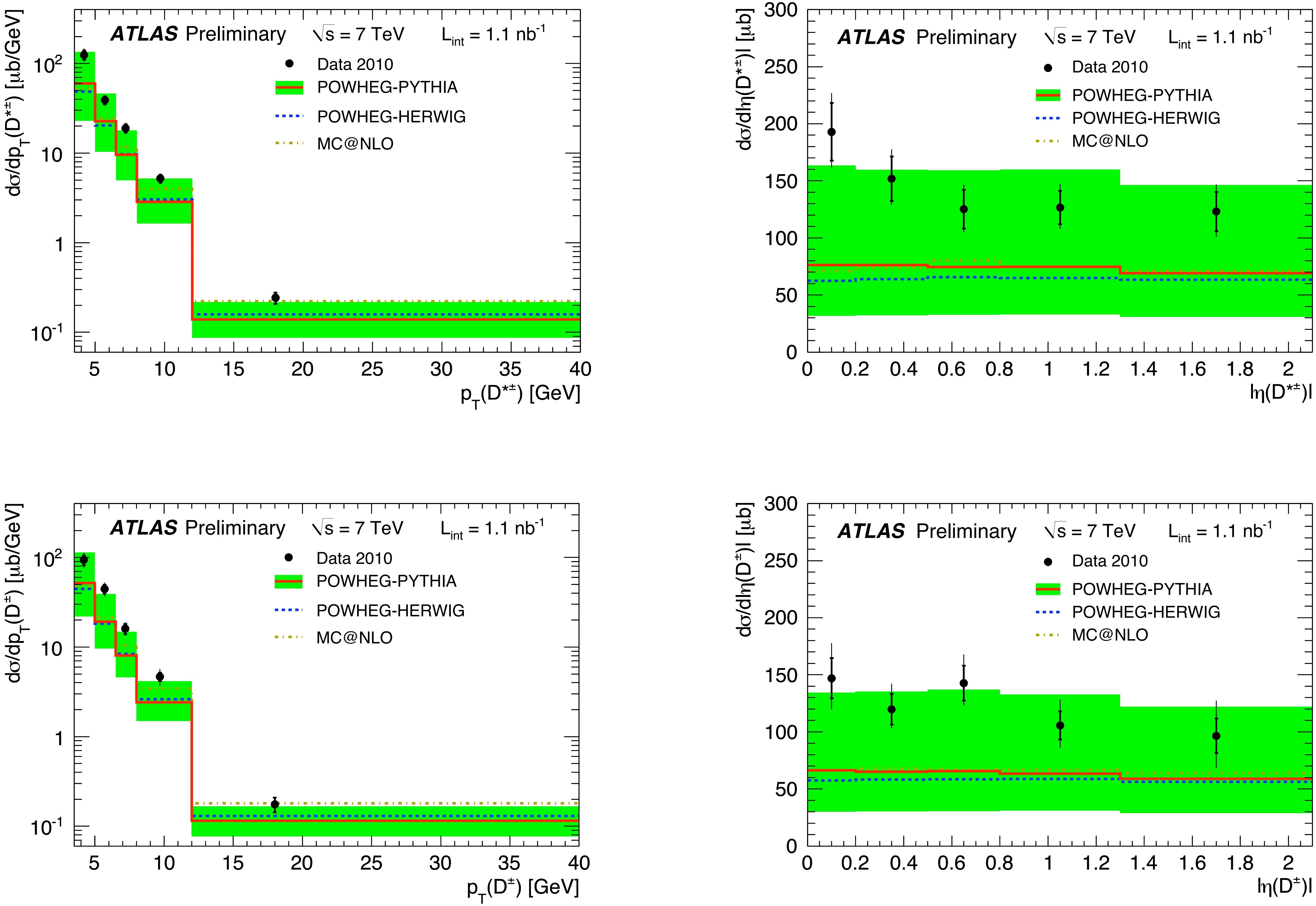
Cross-sections include contributions from beauty

Results compared to theoretical predictions:

MC@NLO
POWHEG-PYTHIA 6.4
POWHEG-HERWIG 6.5

ATLAS-CONF-2011-017

Open charm production (ATLAS)



Open charm production (ATLAS)

Cross-sections in the kinematic region $p_T > 3.5\ GeV \quad |\eta| < 2.1$

$$\sigma^{vis}(D^{*\pm}) = 285 \pm 16(\text{stat.})^{+32}_{-27}(\text{syst.}) \pm 31(\text{lum.}) \pm 4(\text{br.})\,\mu\text{b}$$

$$\sigma^{vis}(D^{\pm}) = 238 \pm 13(\text{stat.})^{+35}_{-23}(\text{syst.}) \pm 26(\text{lum.}) \pm 10(\text{br.})\,\mu\text{b}$$

$$\sigma^{vis}(D_s^{\pm}) = 168 \pm 34(\text{stat.})^{+27}_{-25}(\text{syst.}) \pm 18(\text{lum.}) \pm 10(\text{br.})\,\mu\text{b}$$

Total cross-sections extrapolated using POWHEG-PYTHIA
(after subtraction of the cross-section fractions originating from beauty production)

$$\sigma^{tot}_{c\bar{c}}(D^{*\pm}) = 3.36 \pm 0.19(\text{stat.})^{+0.38}_{-0.32}(\text{syst.}) \pm 0.40(\text{lum.}) \pm 0.05(\text{br.})^{+1.76}_{-0.82}(\text{extr.})\,\text{mb}$$

$$\sigma^{tot}_{c\bar{c}}(D^{\pm}) = 3.10 \pm 0.17(\text{stat.})^{+0.46}_{-0.30}(\text{syst.}) \pm 0.34(\text{lum.}) \pm 0.13(\text{br.})^{+1.70}_{-0.89}(\text{extr.})\,\text{mb}$$

$$\sigma^{tot}_{c\bar{c}}(D_s^{\pm}) = 1.90 \pm 0.38(\text{stat.})^{+0.30}_{-0.28}(\text{syst.}) \pm 0.21(\text{lum.}) \pm 0.11(\text{br.})^{+1.23}_{-0.55}(\text{extr.})\,\text{mb}$$

Using POWHEG-PYTHIA to extrapolate to full phase space:

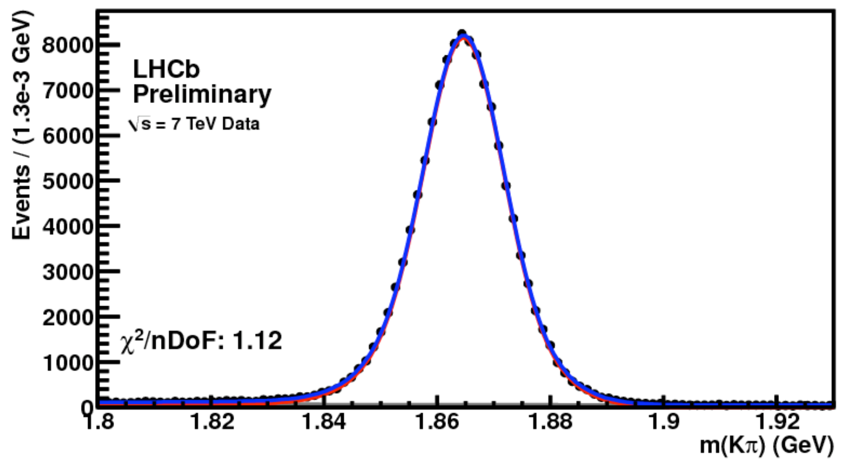
$$\sigma^{tot}_{c\bar{c}} = 7.13 \pm 0.28(\text{stat.})^{+0.90}_{-0.66}(\text{syst.}) \pm 0.78(\text{lum.})^{+3.82}_{-1.90}(\text{extr.})\,\text{mb}$$

$A_p(D^0)$ Production Asymmetry (LHCb)

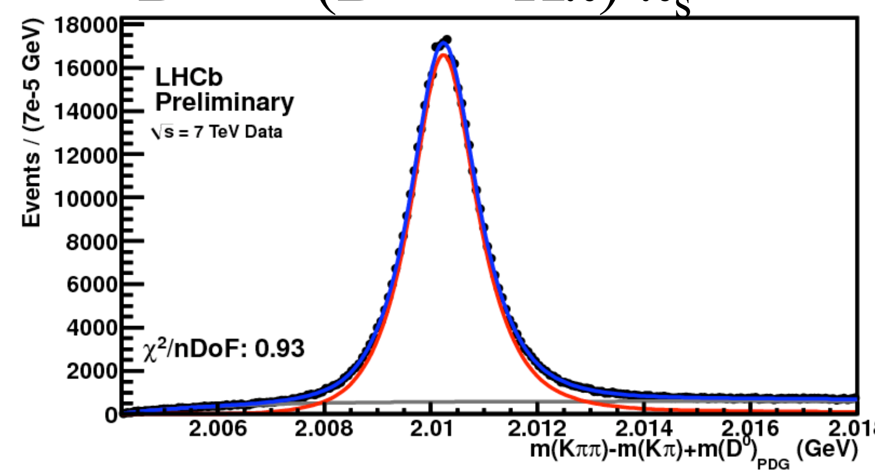
$$\mathcal{L} = 37\ pb^{-1}$$

Extracted from measured time integrated asymmetries in D^*, $D^0 \to hh$ and using external constraints on $A_{CP}(KK)$ and $A_{CP}(\pi\pi)$

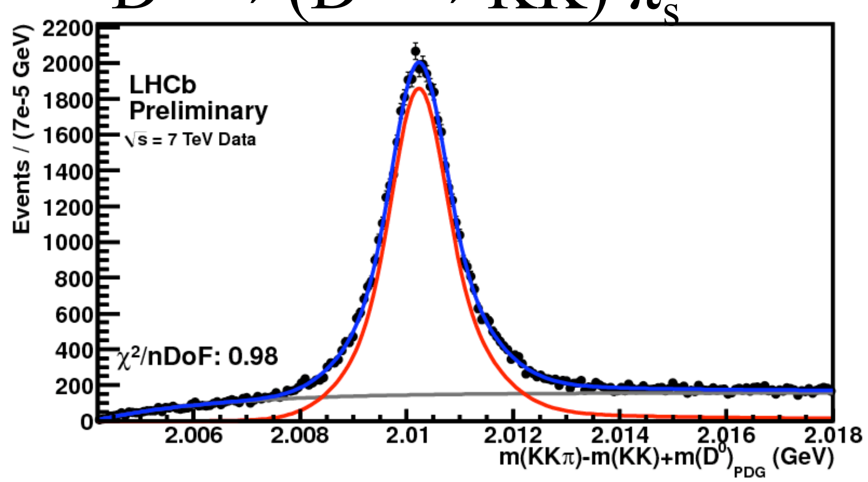
$D^0 \to K\pi$



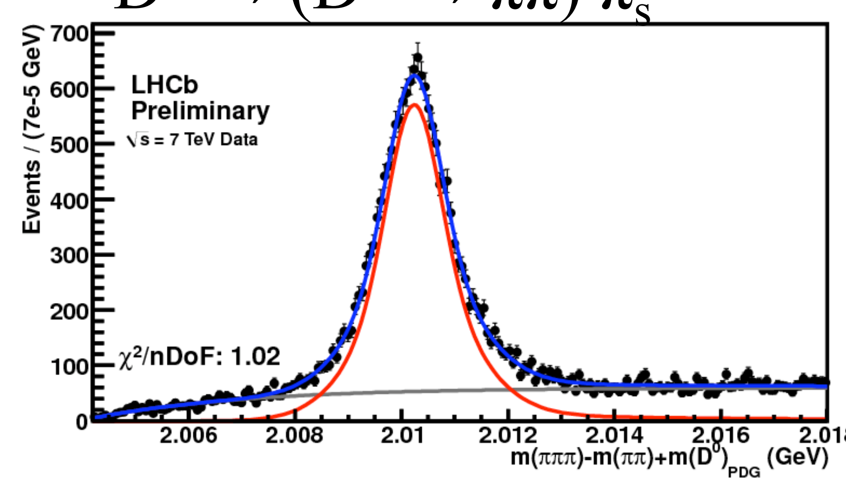
$D^* \to (D^0 \to K\pi)\ \pi_s$



$D^* \to (D^0 \to KK)\ \pi_s$



$D^* \to (D^0 \to \pi\pi)\ \pi_s$



from Alexandr Kozlinskiy's talk at Beauty 2011

$A_p(D^0)$ Production Asymmetry (LHCb)

$$
\begin{aligned}
A_{CP}^{RAW}(K\pi) &= A_{CP}(K\pi) + A_D(K\pi) && + A_P(D^0) \\
A_{CP}^{RAW}(K\pi)^* &= A_{CP}(K\pi) + A_D(K\pi) && + A_D(\pi_s) + A_P(D^*) \\
A_{CP}^{RAW}(KK)^* &= A_{CP}(KK) && + A_D(\pi_s) + A_P(D^*) \\
A_{CP}^{RAW}(\pi\pi)^* &= A_{CP}(\pi\pi) && + A_D(\pi_s) + A_P(D^*)
\end{aligned}
$$

4 observables

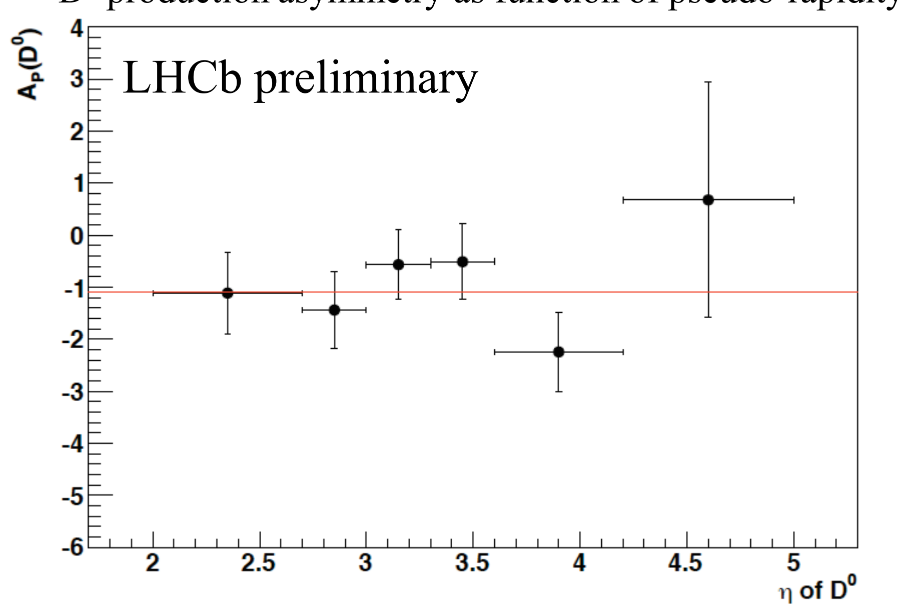
3 ext. inputs
Physics CP asymmetries.
$A_{CP}(K\pi)$ assumed negligible

3 unknowns:
Detection asymmetry of D^0.
Detection asymmetry of soft pion.
D^0 and D^* production asymmetries.

$$A_p(D^0) = (-1.08 \pm 0.32 \pm 0.12)\%$$

Stat error plus fully propagated errors on input quantities: world averages of $A_{CP}(KK)$ and $A_{CP}(\pi\pi)$

D^0 production asymmetry as function of pseudo-rapidity



Summary of systematic uncertainties:

• Modeling of line-shape	0.04%
• D^0 mass window	0.09%
• Multiple candidates	0.02%
• Binning in (pt, η)	0.04%
• Non-prompt D^0's	0.06%
• Total systematic	0.12%

no evidence of strong dependence of production asymmetry on pseudo-rapidity

from Alexandr Kozlinskiy's talk at Beauty 2011

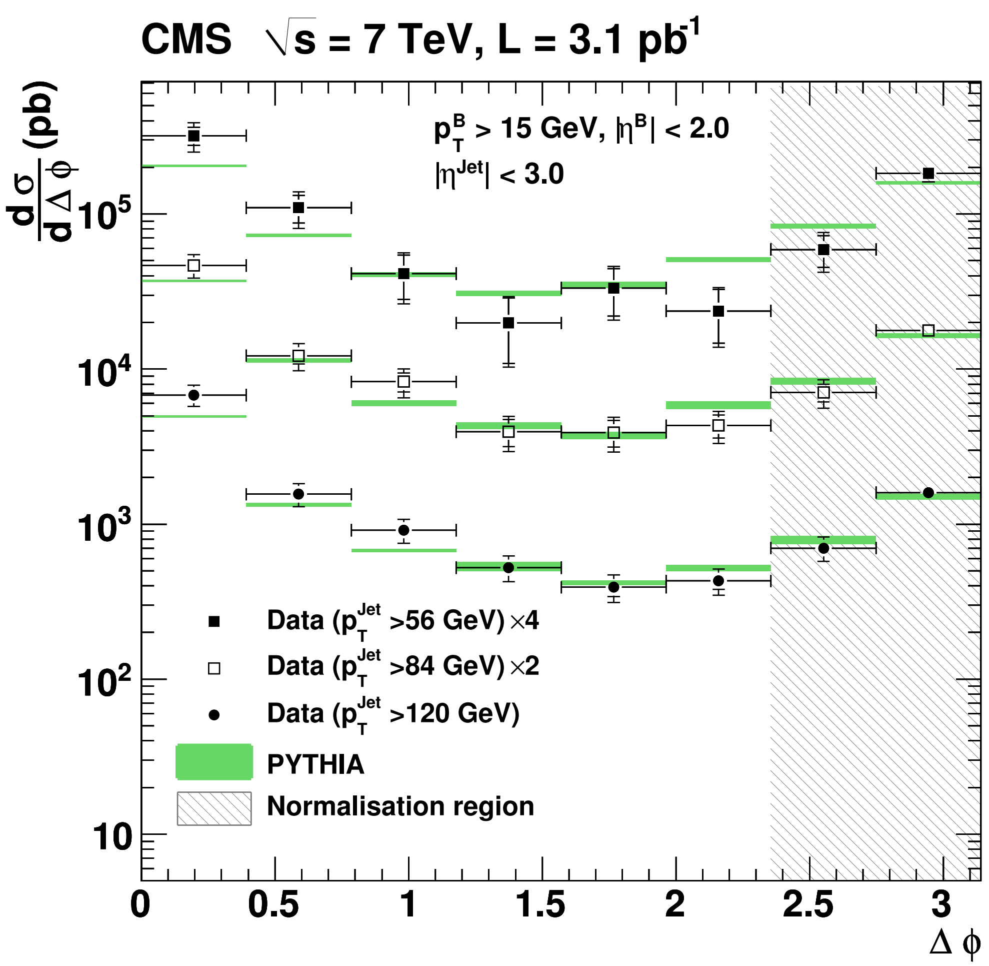
$B\bar{B}$ Angular Correlations (CMS)

$B\bar{B}$ -pair production as a function of the opening angle for different event scales

Reconstructed from displaced secondary vertices

$\Delta\phi$ (difference in azimuthal angles of reconstructed B hadrons) $\Delta R = \sqrt{\Delta\eta^2 + \Delta\phi^2}$

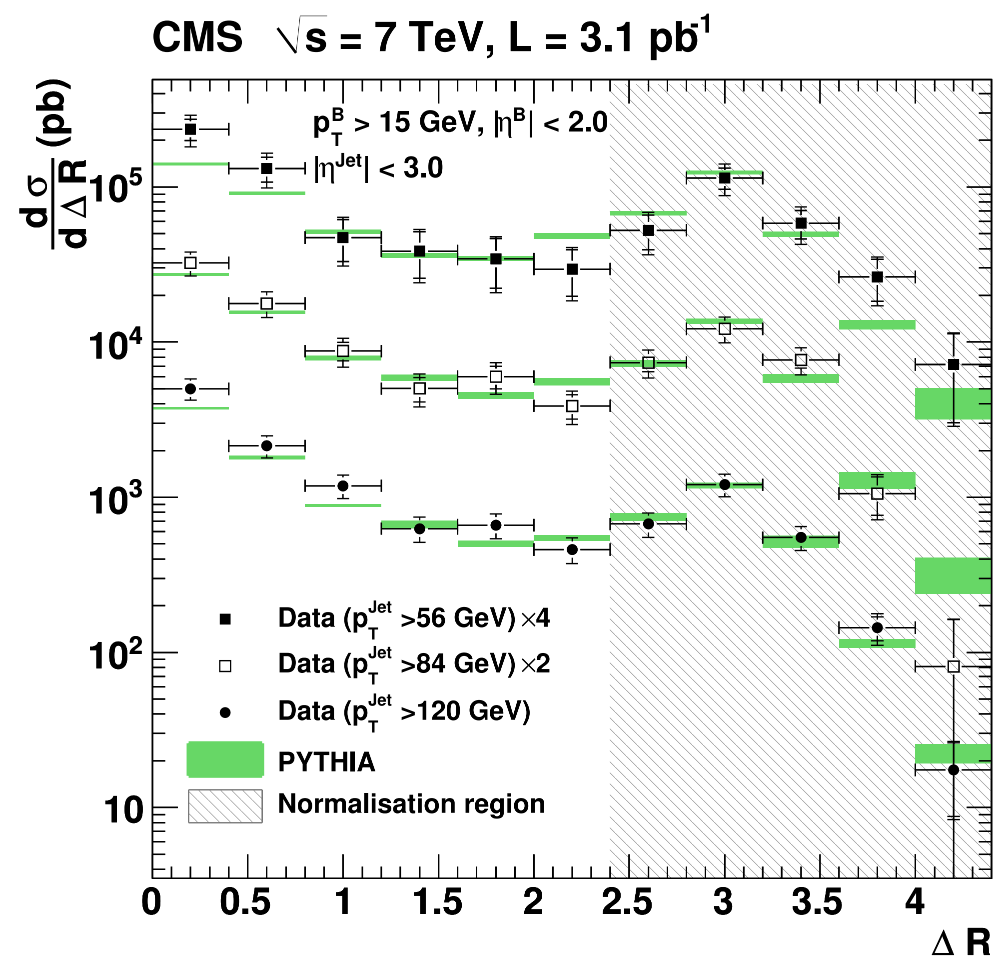
$|\eta(B)| < 2.0 \quad p_T(B) > 15\ GeV \quad |\eta(jet)| < 3.0 \quad \mathcal{L} = 3.1\ pb^{-1}$



$p_T^{Jet} > 56\ GeV$

$p_T^{Jet} > 84\ GeV$

$p_T^{Jet} > 120\ GeV$



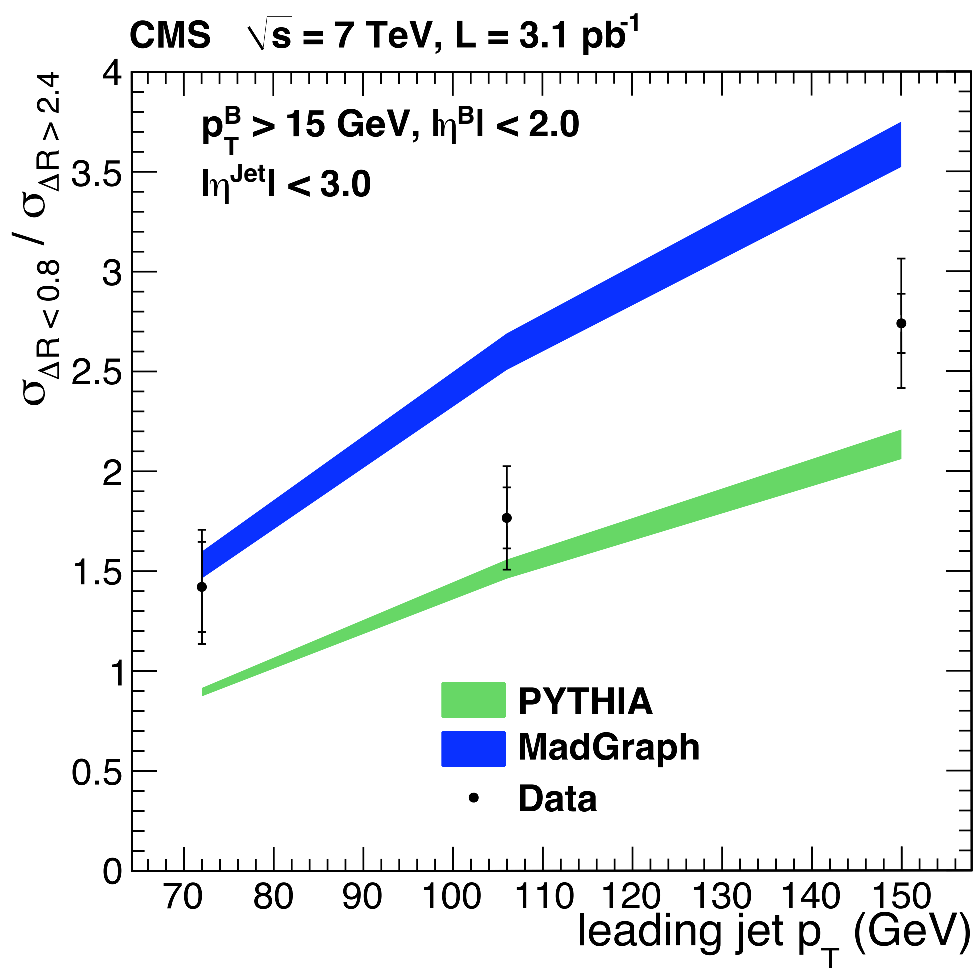
The data exhibit a substantial enhancement of the cross-section at small angular separation

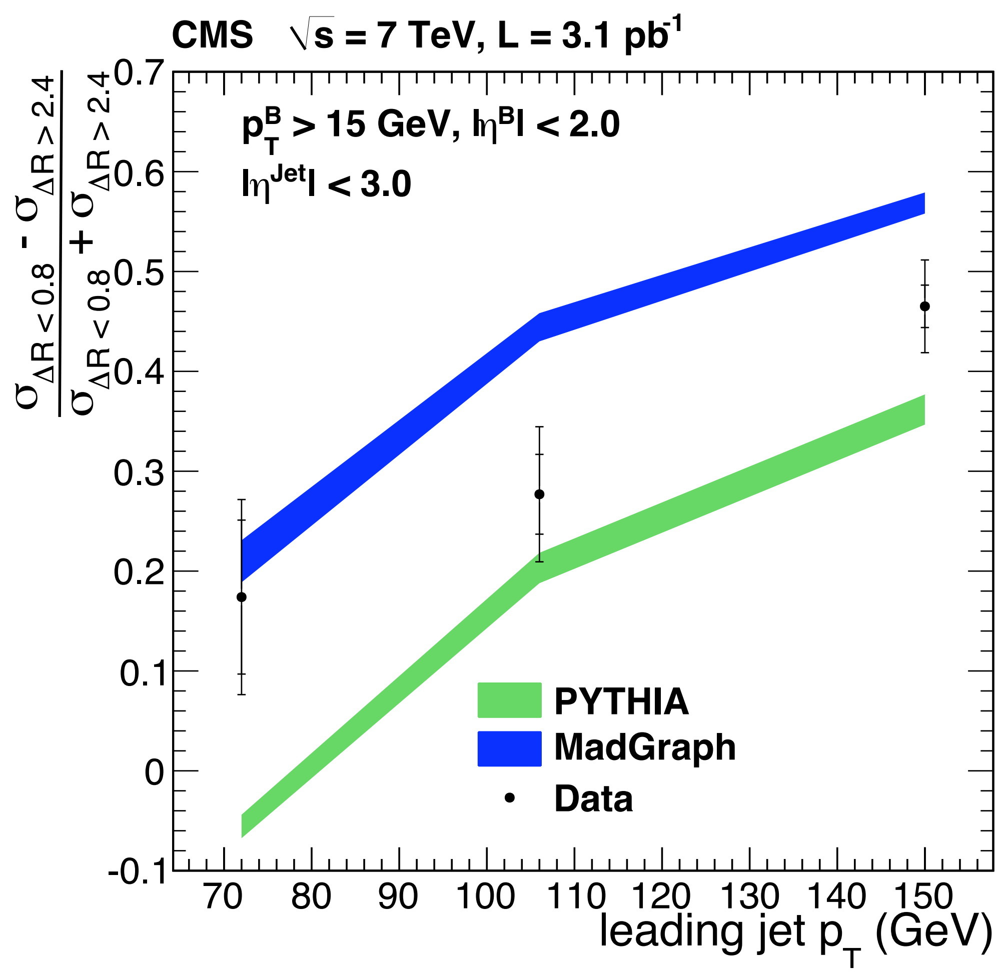
CERN-PH-EP-2010-093

$B\bar{B}$ Angular Correlations (CMS)

Ratio and asymmetry between the $B\bar{B}$ production cross-sections in

$$\Delta R < 0.8 \text{ and } \Delta R > 2.4$$





PYTHIA: tune D6T, CTEQ6L1 PDF

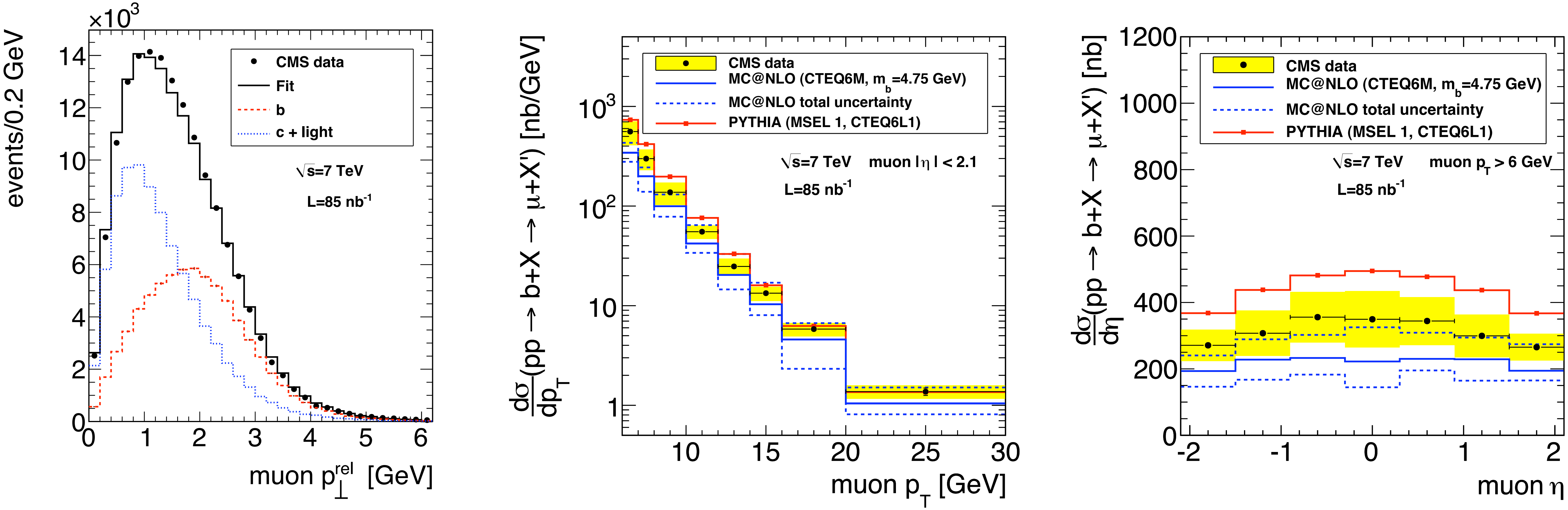
MADGRAPH/MADEVENT4, showering by PYTHIA

Inclusive b-hadron production with muons (CMS)

$p_T^{\mu} > 6\ GeV$ $|\eta^{\mu}| < 2.1$ $\mathcal{L} = 85\ nb^{-1}$

Relative transverse momentum of the muon with respect to an associated jet is used to determine the fraction of signal events in a ML fit

low-threshold single-muon trigger



$$\sigma = 1.32 \pm 0.01(\mathrm{stat}) \pm 0.30(\mathrm{syst}) \pm 0.15(\mathrm{lumi})\ \mu\mathrm{b}$$

$$\sigma_{\mathrm{MC@NLO}} = 0.84^{+0.36}_{-0.19}(\mathrm{scale}) \pm 0.08(m_{\mathrm{b}}) \pm 0.04(\mathrm{pdf})\ \mu\mathrm{b}$$

PYTHIA 6.422: tune D6T, CTEQ6L1 PDF

MC@NLO: CTEQ6M PDF

arXiv:1101.3512v1 [hep-ex]

Inclusive b-jet production (CMS)

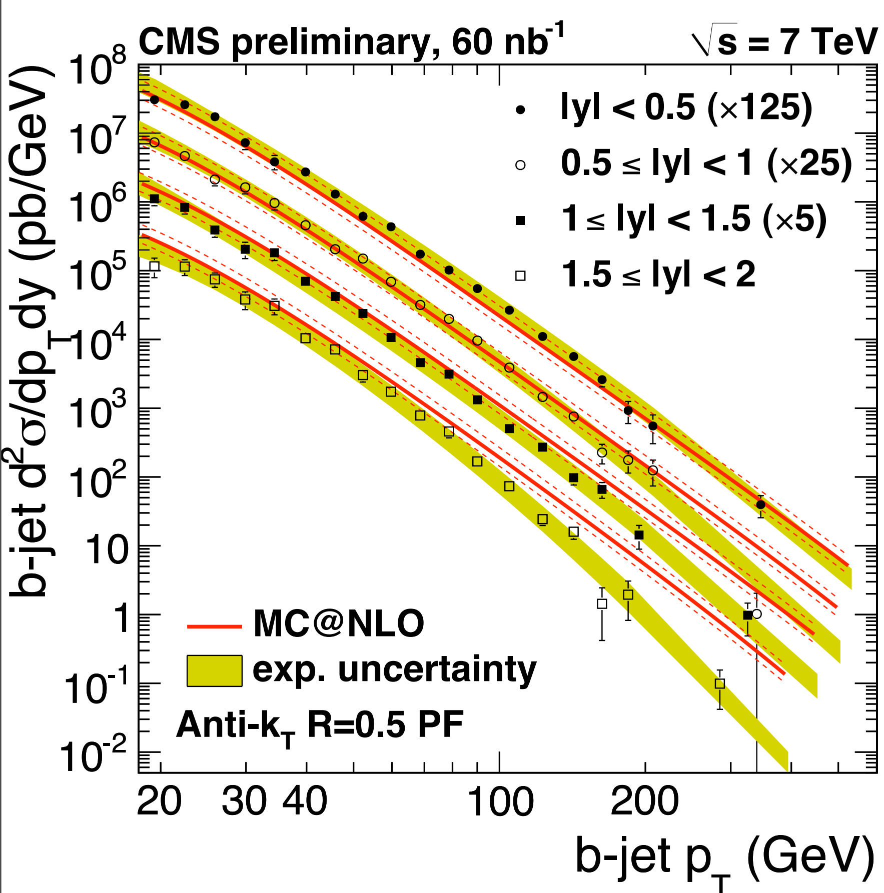
$18 < p_T < 300\ GeV \qquad |y| < 2.0 \qquad \mathcal{L} = 60\ nb^{-1}$

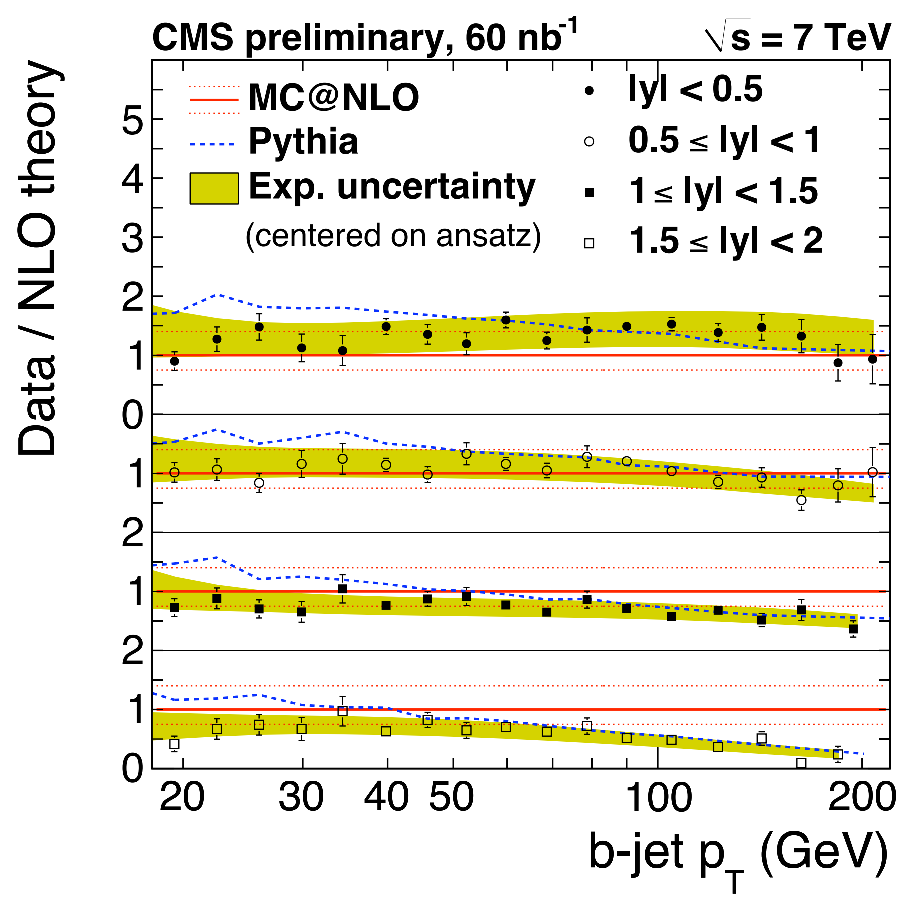
b-jets identified using secondary vertices with > 3 tracks

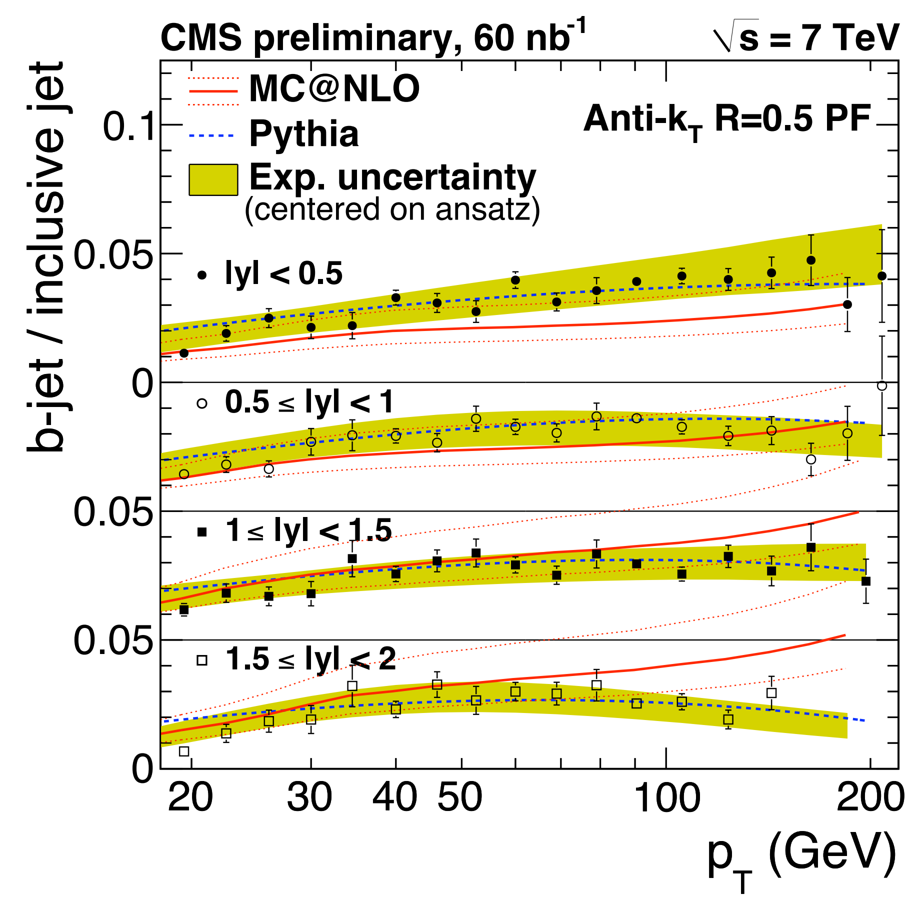
efficiency: from semi-leptonic decays

purity: from a template fit to the mass of the secondary vertex

min bias and single triggers







PYTHIA: good agreement

MC@NLO: shape differences

fit to: ratio data to PYTHIA in

$30 < p_T < 150\ GeV \quad |y| < 2.0$

$0.99 \pm 0.02\ (stat) \pm 0.21\ (syst)$

ratio to inclusive jet production (to reduce uncertainties from jet energy corrections and resolution and from luminosity)

PYTHIA: tune D6T MC@NLO: CTEQ6M PDF

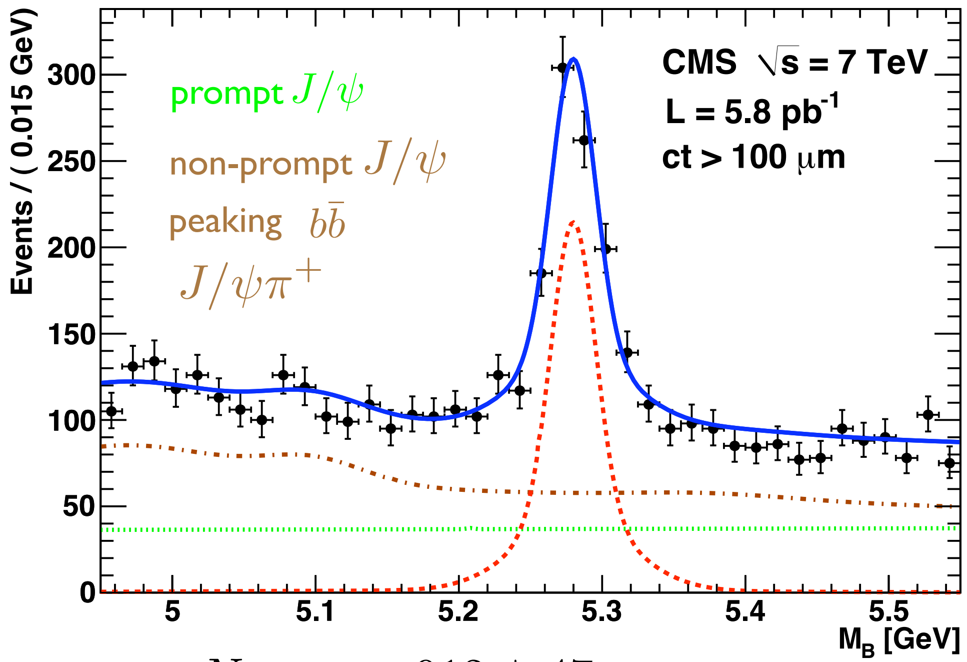
inclusive jet: NLOJet++, CTEQ6.6M PDF and fastNLO

CMS-PAS-BPH-10-009

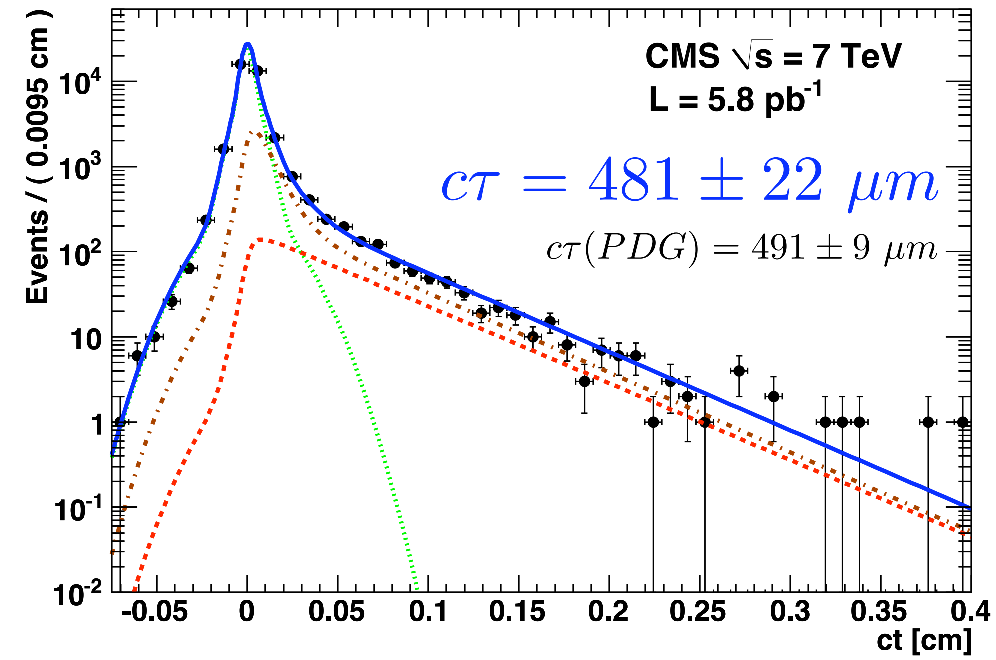
B-meson Production (CMS)

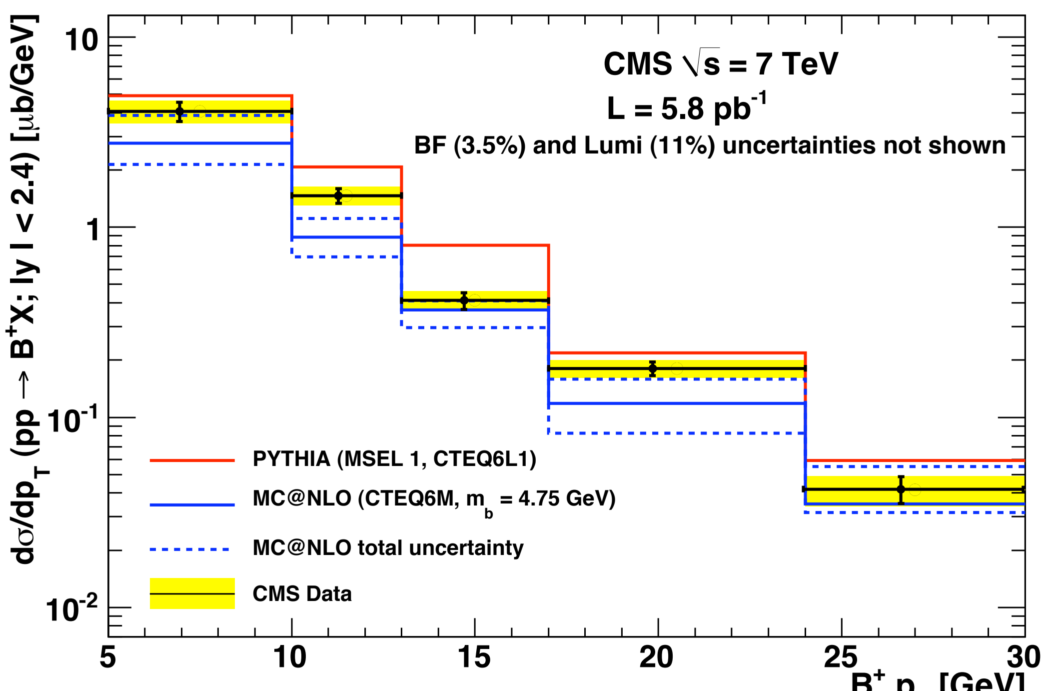
$B^+ \rightarrow J/\psi(\mu^+\mu^-)K^+$

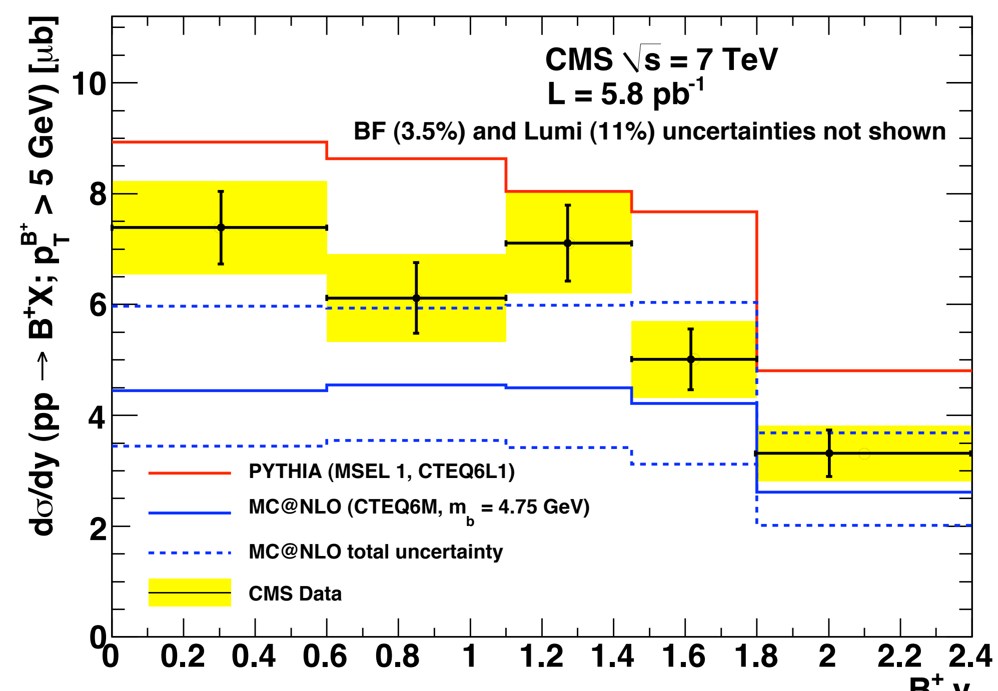
$p_T^B > 5\ GeV$ $|y^B| < 2.4$ $\mathcal{L} = 5.8\ pb^{-1}$



$N_{signal} = 912 \pm 47$







$\sigma^{tot} = 28.1 \pm 2.4\ (stat) \pm 2.0\ (syst) \pm 3.1\ (lumi)\ \mu b$

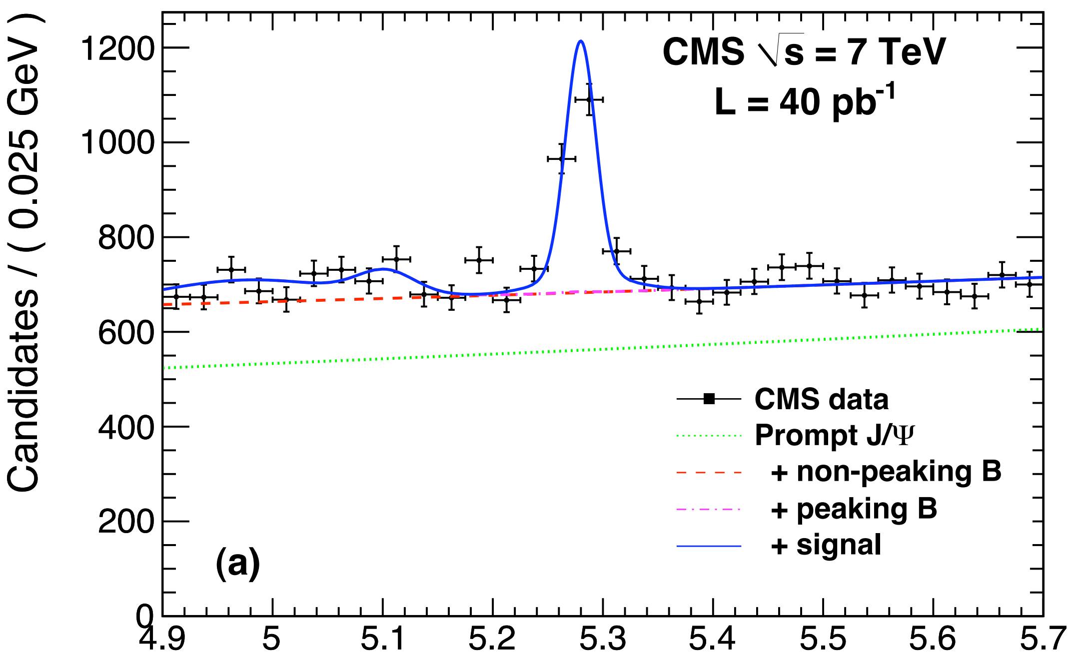
now: $\sigma^{tot} = 28.3 \pm 2.4\ (stat) \pm 2.0\ (syst) \pm 1.1\ (lumi)\ \mu b$

$MC@NLO : 25.5^{+9.2}_{-5.7}\ \mu b$

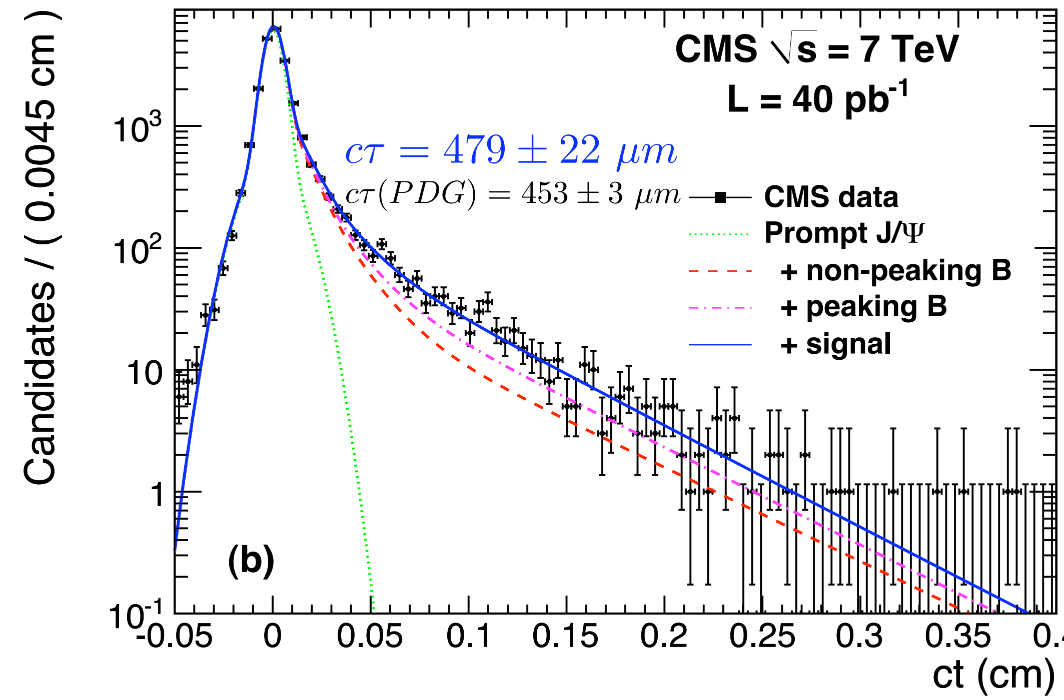
Phys.Rev.Lett.106:112001,2011

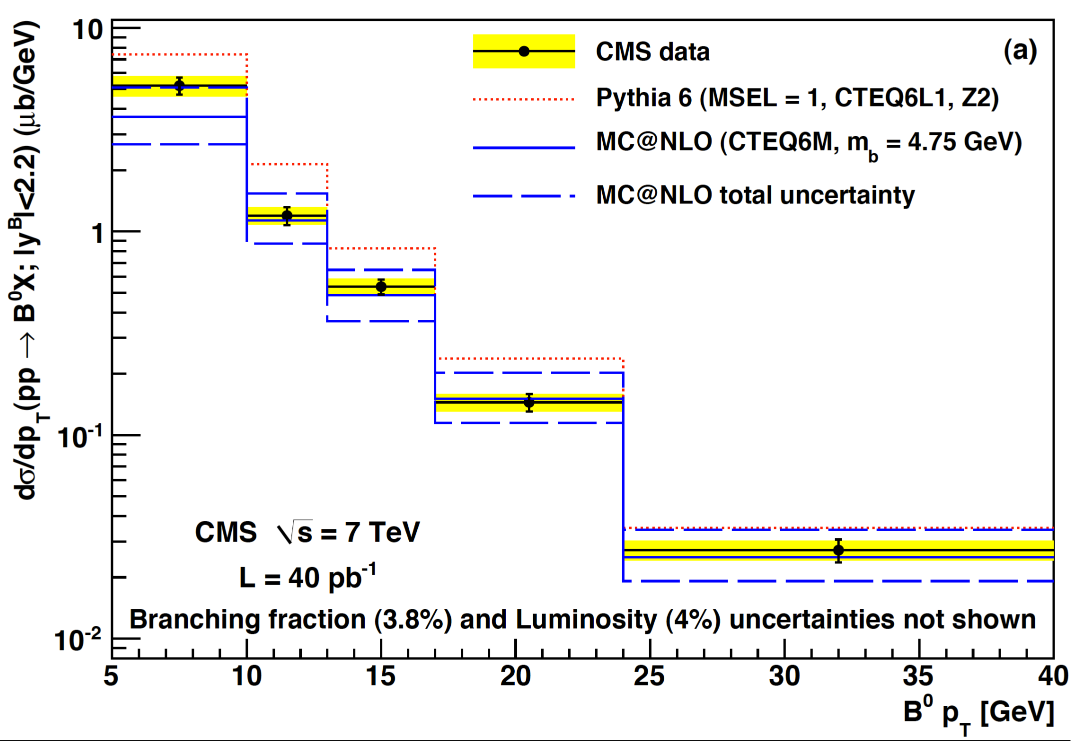
B-meson Production (CMS) $B_d^0 \to J/\psi(\mu^+\mu^-)K_S^0(\pi^+\pi^-)$

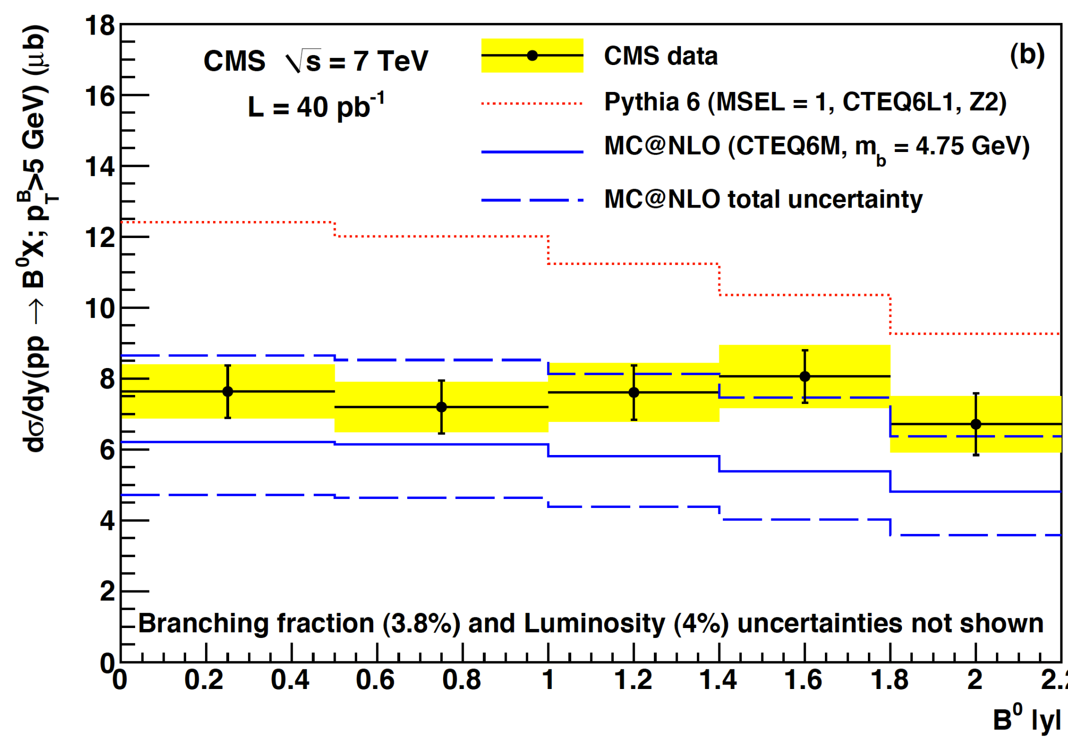
$p_T^B > 5\ GeV$ $|y^B| < 2.2$ $\mathcal{L} = 40\ pb^{-1}$



$N_{signal} = 809 \pm 39$





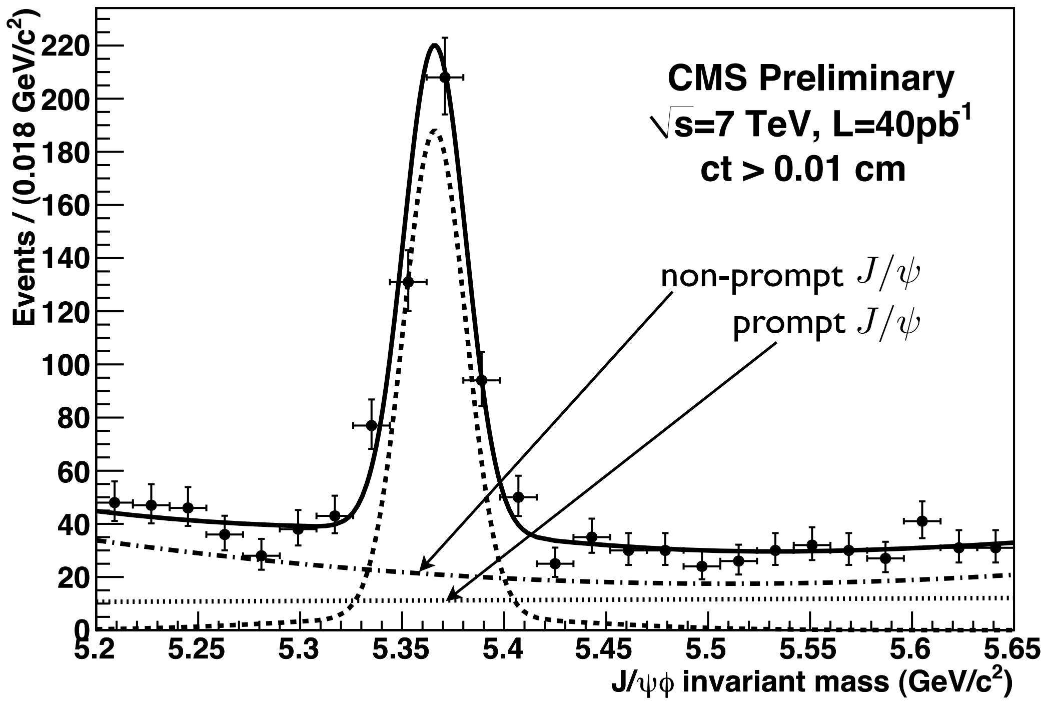


$\sigma^{tot} = 33.2 \pm 2.5\ (stat) \pm 3.1\ (syst) \pm 1.3\ (lumi)\ \mu b$ $MC@NLO : 25.5^{+9.6}_{-6.2}\ \mu b$

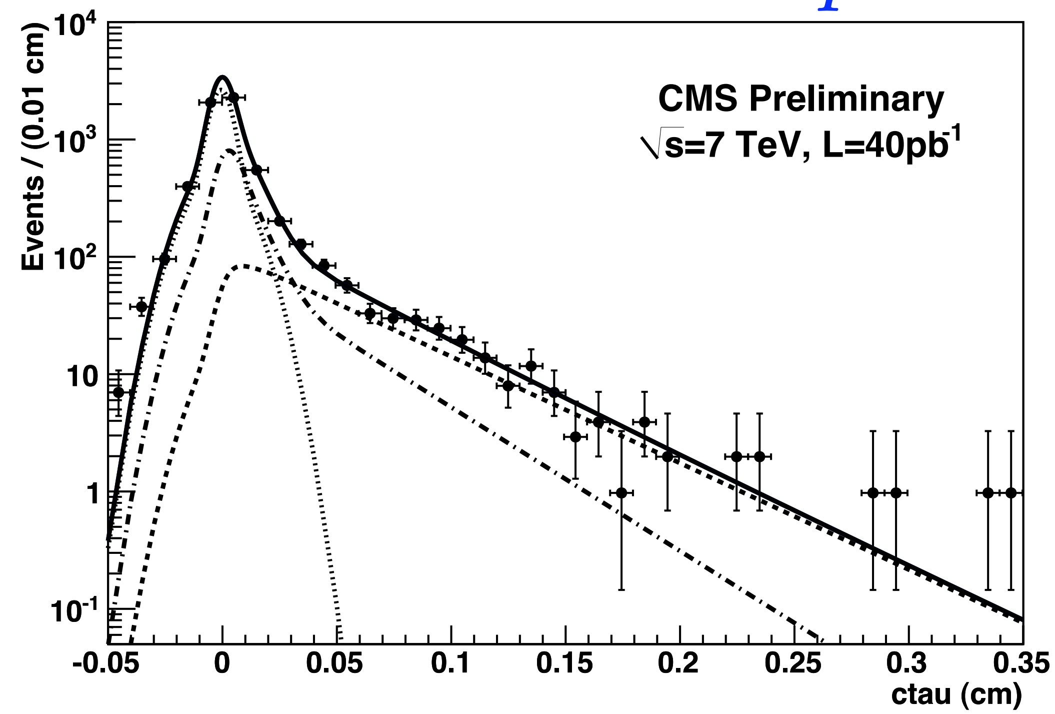
B-meson Production (CMS)

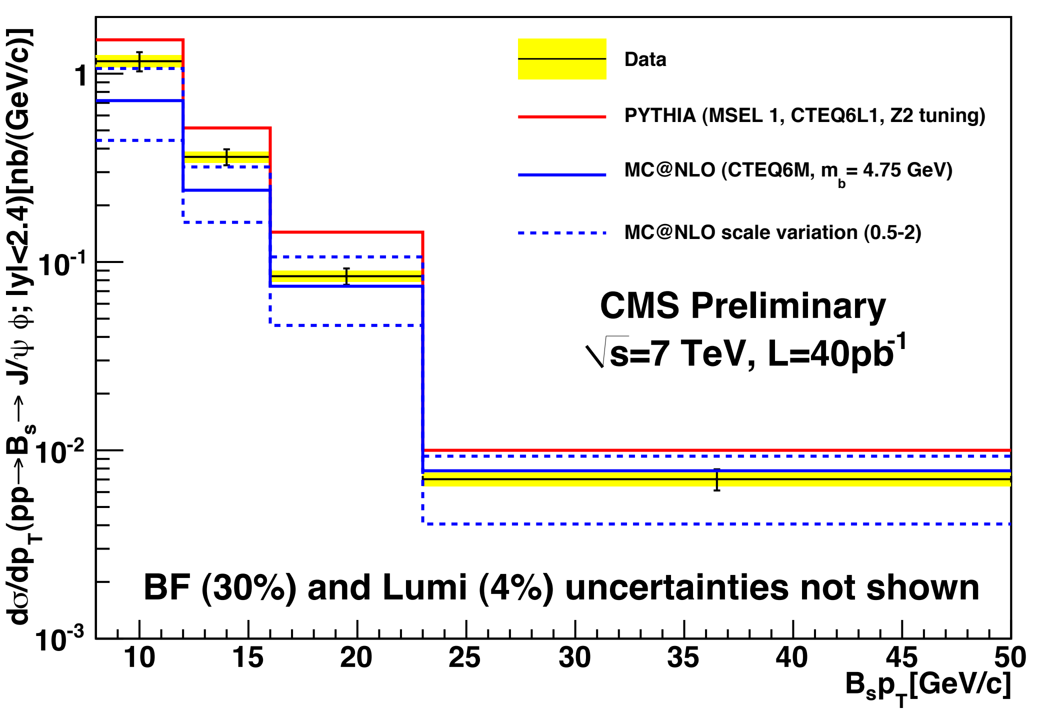
$B_s^0 \to J/\psi(\mu^+\mu^-)\phi(K^+K^-)$

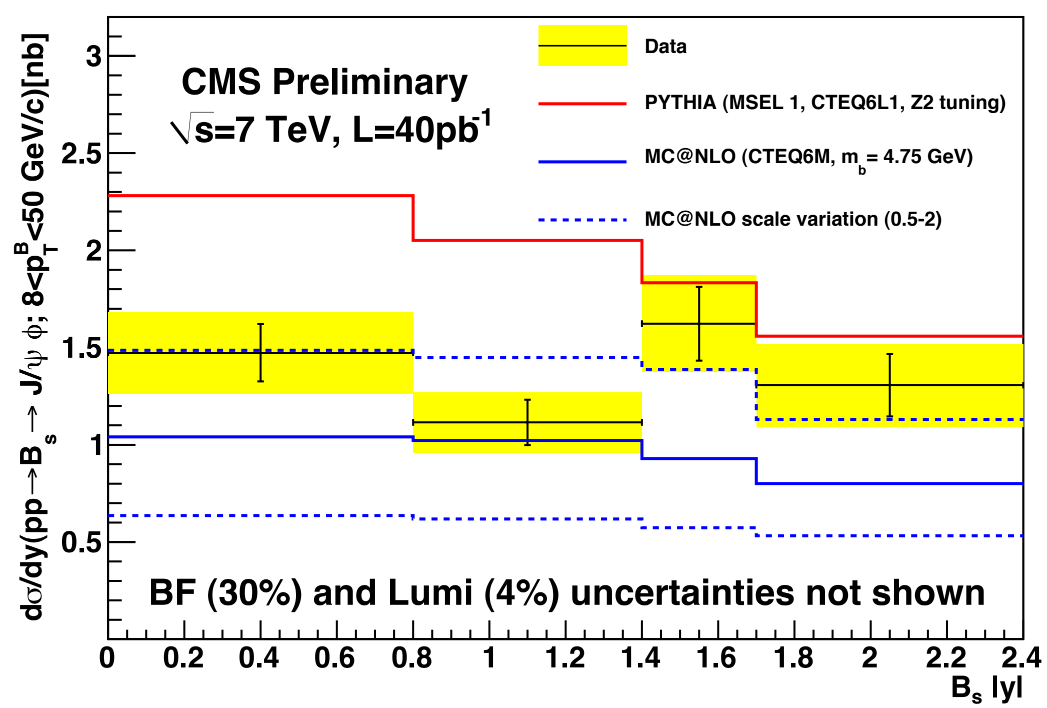
$8 < p_T^B < 50\ GeV$ $|y^B| < 2.4$ $\mathcal{L} = 40\ pb^{-1}$



$N_{signal} = 549 \pm 32$



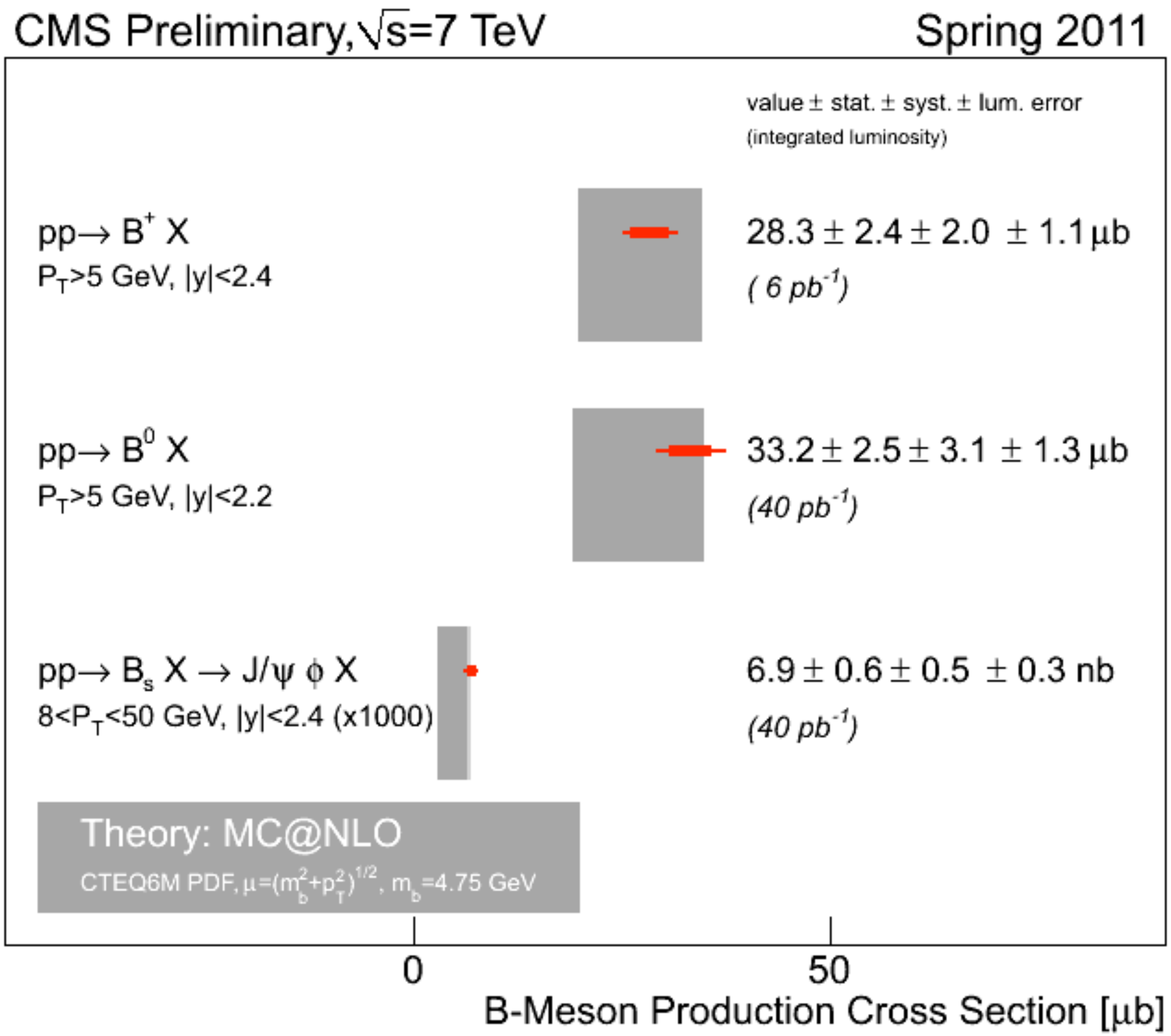




$$\sigma^{tot} = 6.9 \pm 0.6\ (stat) \pm 0.5\ (syst) \pm 0.3\ (lumi)\ nb$$

$MC@NLO : 4.57^{+1.93}_{-1.71} \pm 1.37\ nb$ $PYTHIA : 9.39 \pm 2.82\ nb$

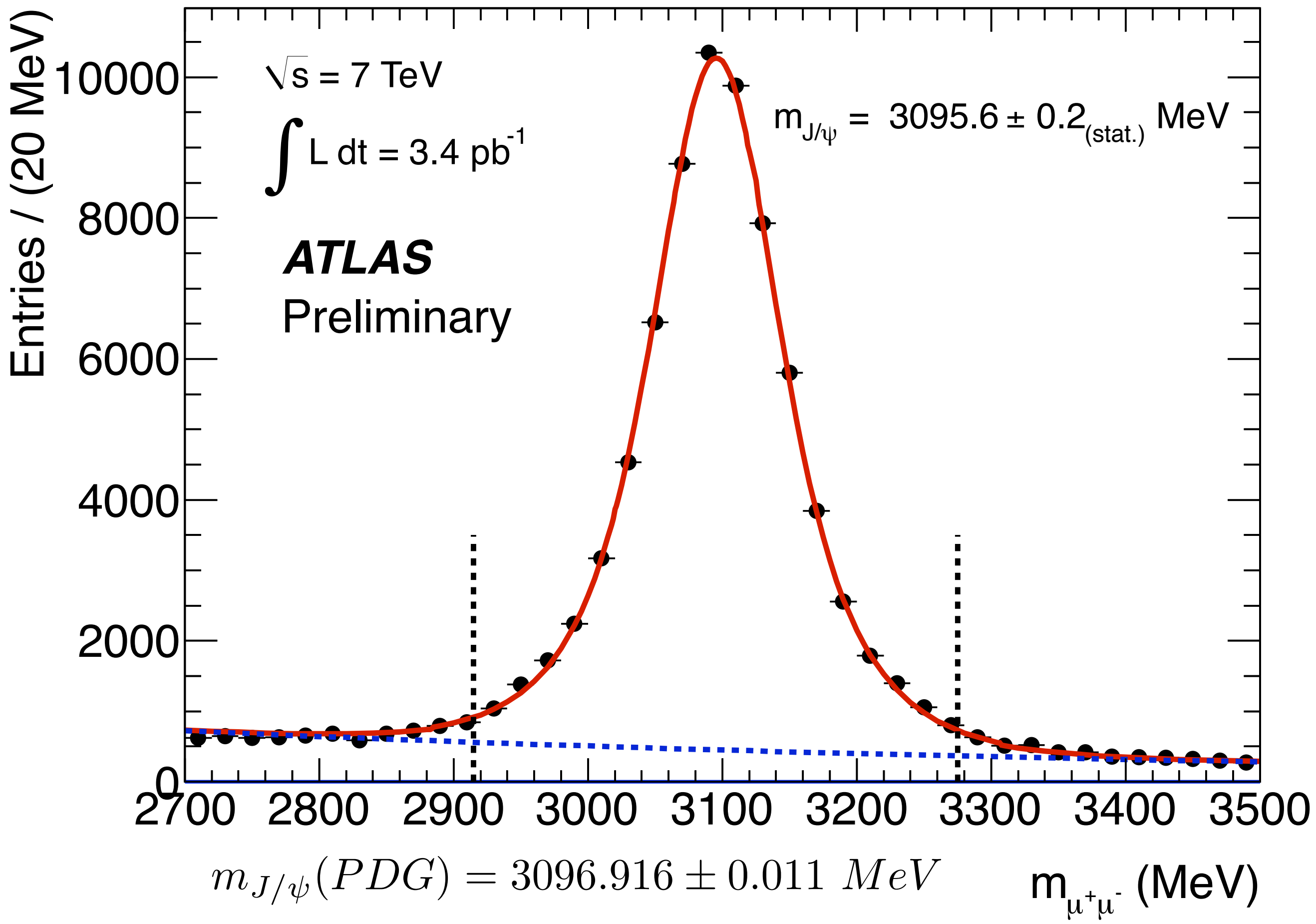
Summary of B-meson Production Cross-sections (CMS)



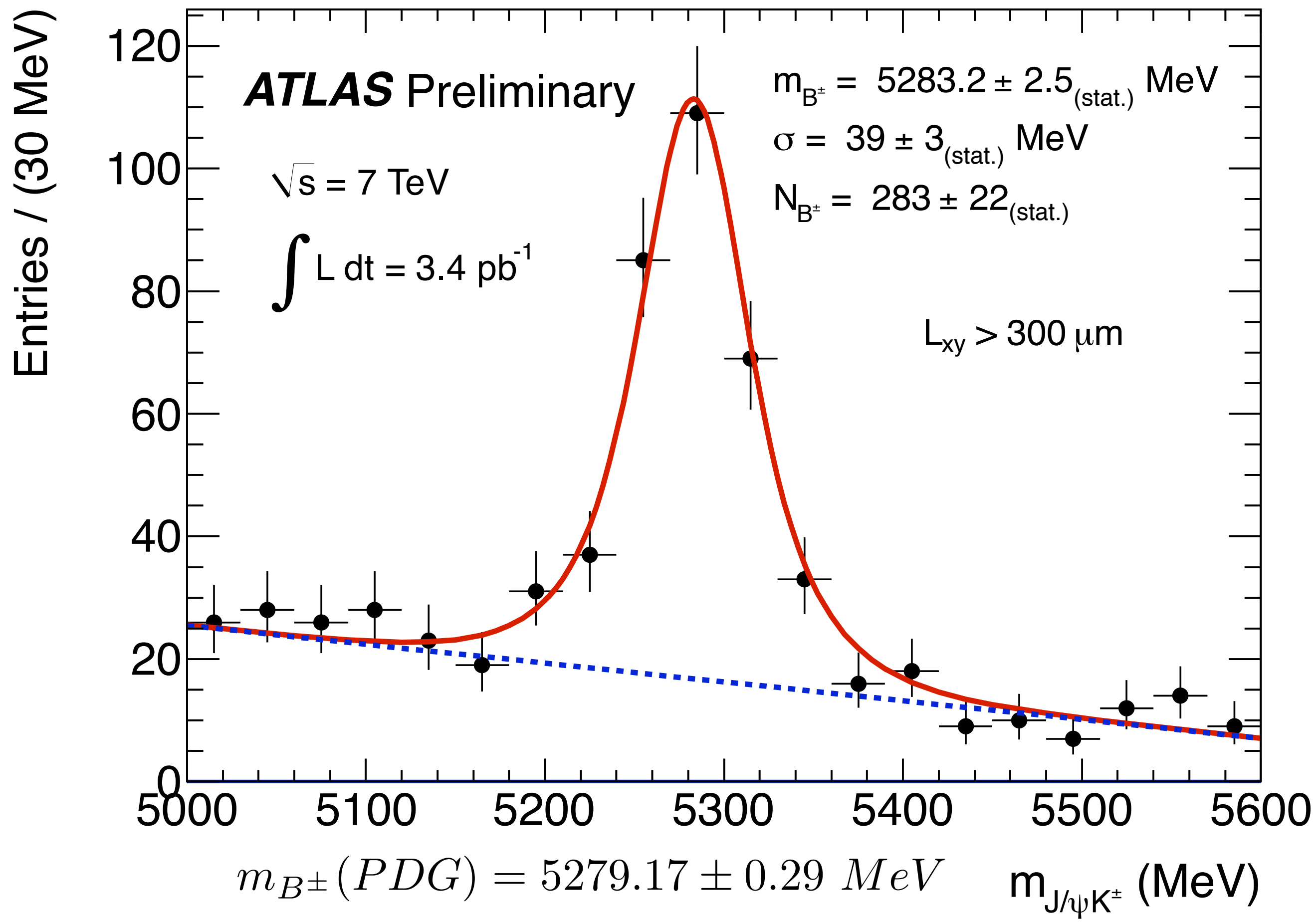
Observation of B-meson Decays (ATLAS)

$$B^{\pm} \to J/\psi K^{\pm} \qquad \mathcal{L} = 3.4\ pb^{-1}$$

Single and di-muon triggers



$m_{J/\psi}(PDG) = 3096.916 \pm 0.011\ MeV$



$m_{B^{\pm}}(PDG) = 5279.17 \pm 0.29\ MeV$

	m_B, MeV	σ_m, MeV	N_{sig}	N_{bkg}	S
$B^{\pm}$	5283.2 ± 2.5	39 ± 3	283 ± 22	131 ± 13	1.09 ± 0.07
B^{+}	5282.6 ± 3.6	40 ± 4	138 ± 15	70 ± 11	1.12 ± 0.11
B^{-}	5283.7 ± 3.3	39 ± 4	146 ± 15	61 ± 8	1.06 ± 0.10
MC	5281.8 ± 0.2	39.8 ± 0.2			1.100 ± 0.003

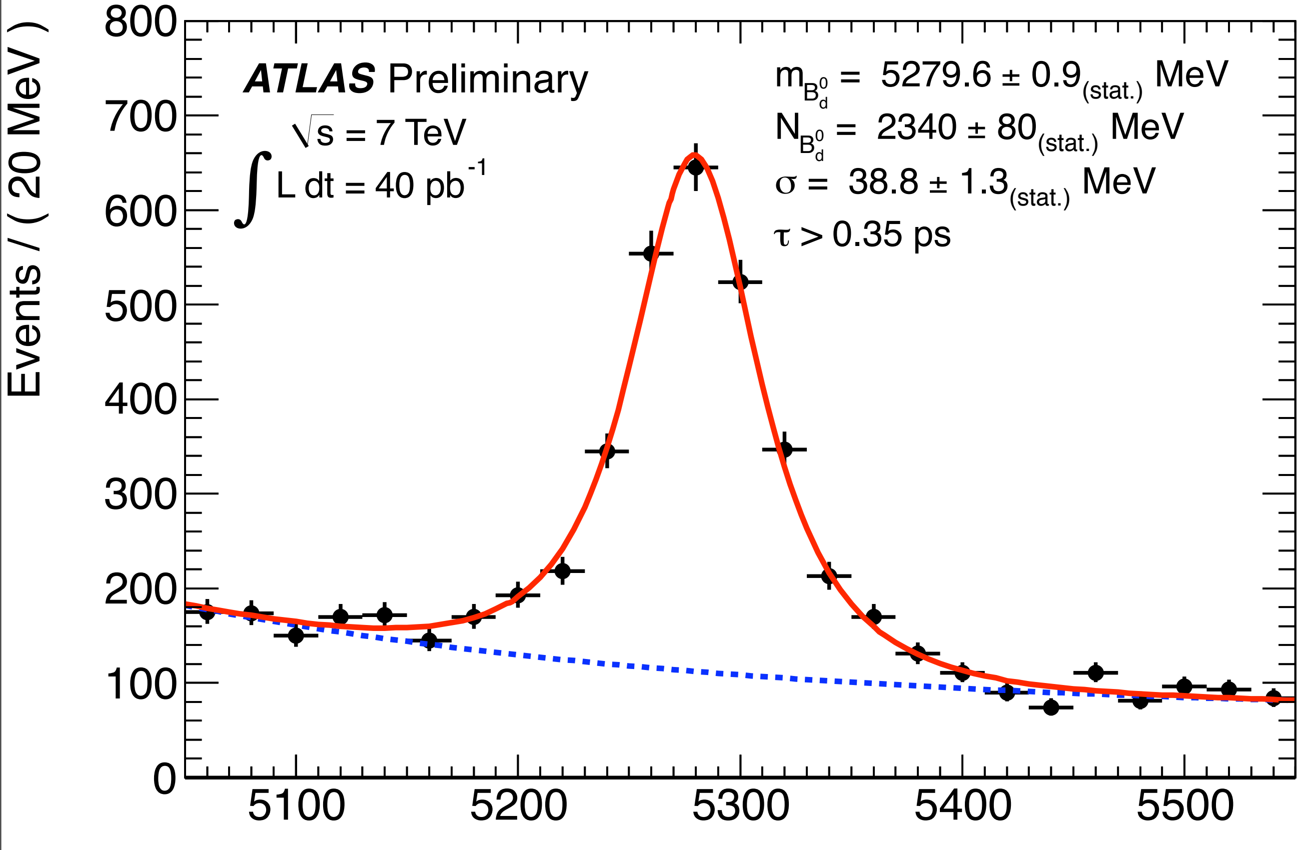
Exclusive B cross-sections expected soon

ATLAS-CONF-2010-098

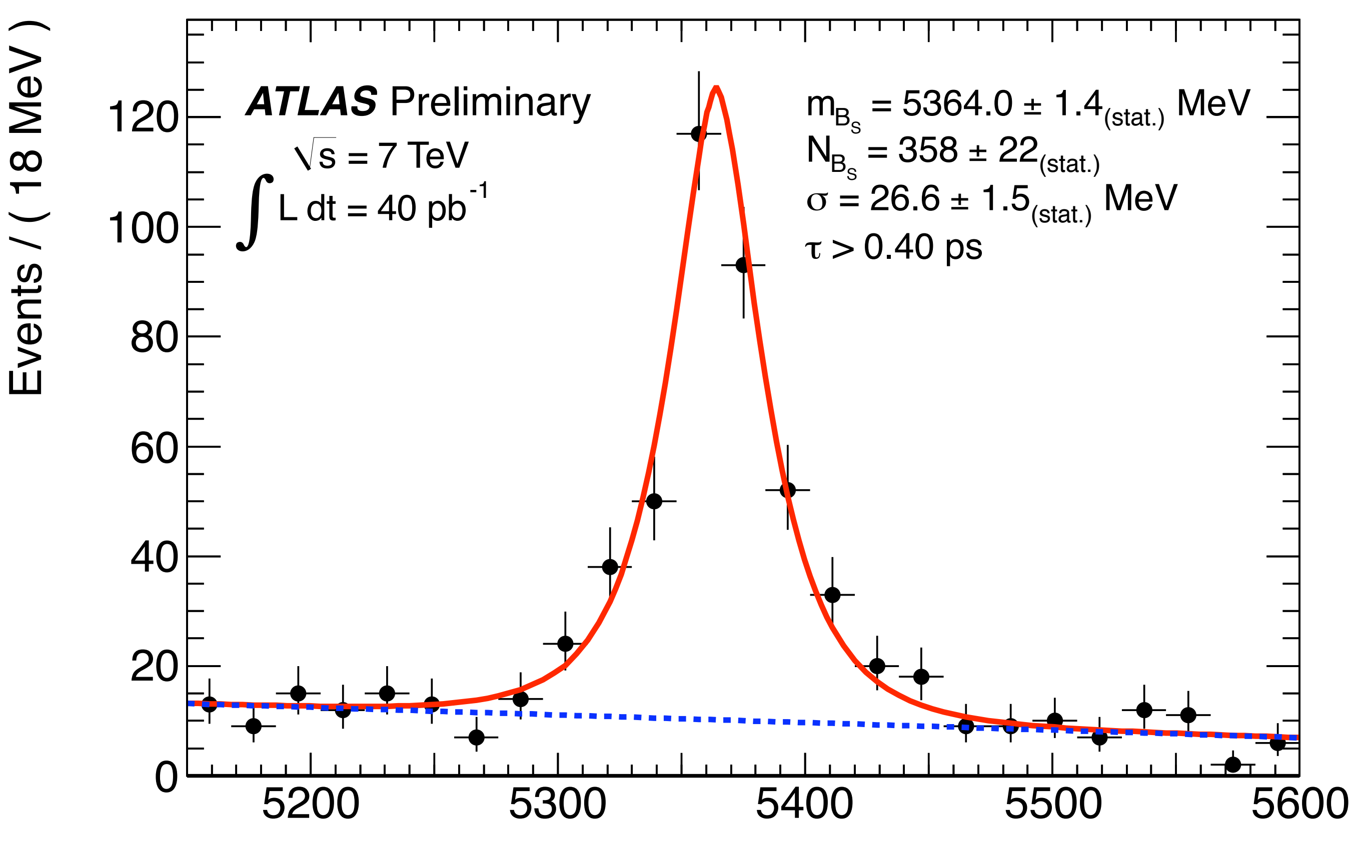
Observation of B-meson Decays (ATLAS)

$\mathcal{L} = 40.3\ pb^{-1}$

$B_d^0 \to J/\psi(\mu^+\mu^-)K^{0*}(K^+\pi^-)$ $\qquad$ $B_s^0 \to J/\psi(\mu^+\mu^-)\phi(K^+K^-)$



$m_{B_d^0}(PDG) = 5279.5 \pm 0.3\ MeV$



$m_{B_s^0}(PDG) = 5366.1 \pm 0.6\ MeV$

		m_B	σ_m	$N_{\rm sig}$	$N_{\rm bkg}$
B_d^0	no τ cut	5278.6 ± 1.3 MeV	36.8 ± 2.0 MeV	2680 ± 150	10280 ± 110
	with τ cut	5279.6 ± 0.9 MeV	38.8 ± 1.3 MeV	2340 ± 80	1330 ± 60
B_s^0	no τ cut	5363.6 ± 1.6 MeV	21.9 ± 1.9 MeV	413 ± 36	764 ± 17
	with τ cut	5364.0 ± 1.4 MeV	26.6 ± 1.5 MeV	358 ± 22	90 ± 7

ATLAS-CONF-2011-050

B-meson Production (LHCb)

$b\bar{b}$ production cross-section in $2 < \eta < 6$ over full pT range

$b \to D^0 X \mu^- \bar{\nu}$ $\quad D^0 \to K^- \pi^+$ $\quad p(\mu) > 3\ GeV$ $\ p_T(\mu) > 0.5\ GeV$

2D unbinned log-likelihood fit to $m(K^-\pi^+)$ & $\ln(IP)$

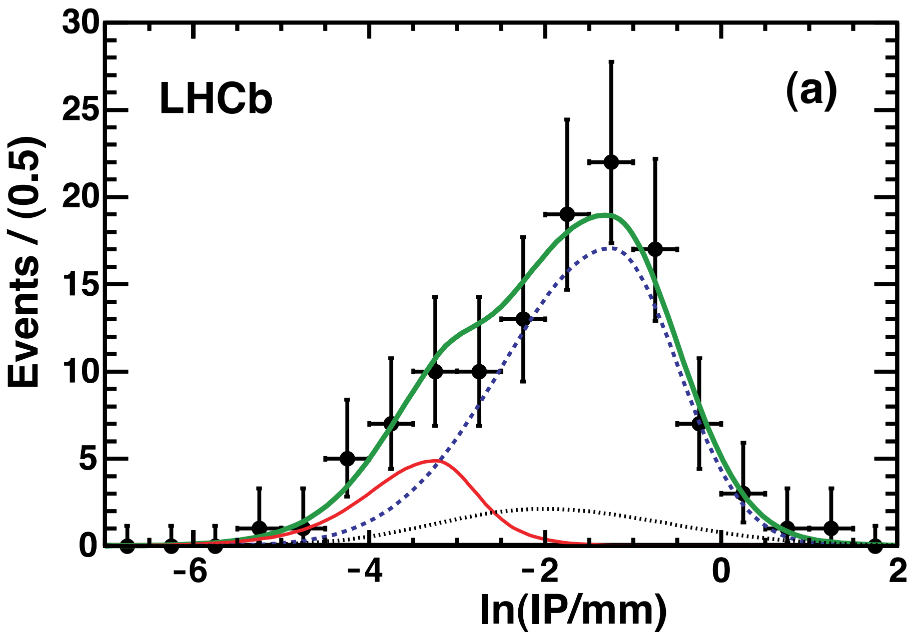
Separate fits for right-sign and wrong-sign combinations

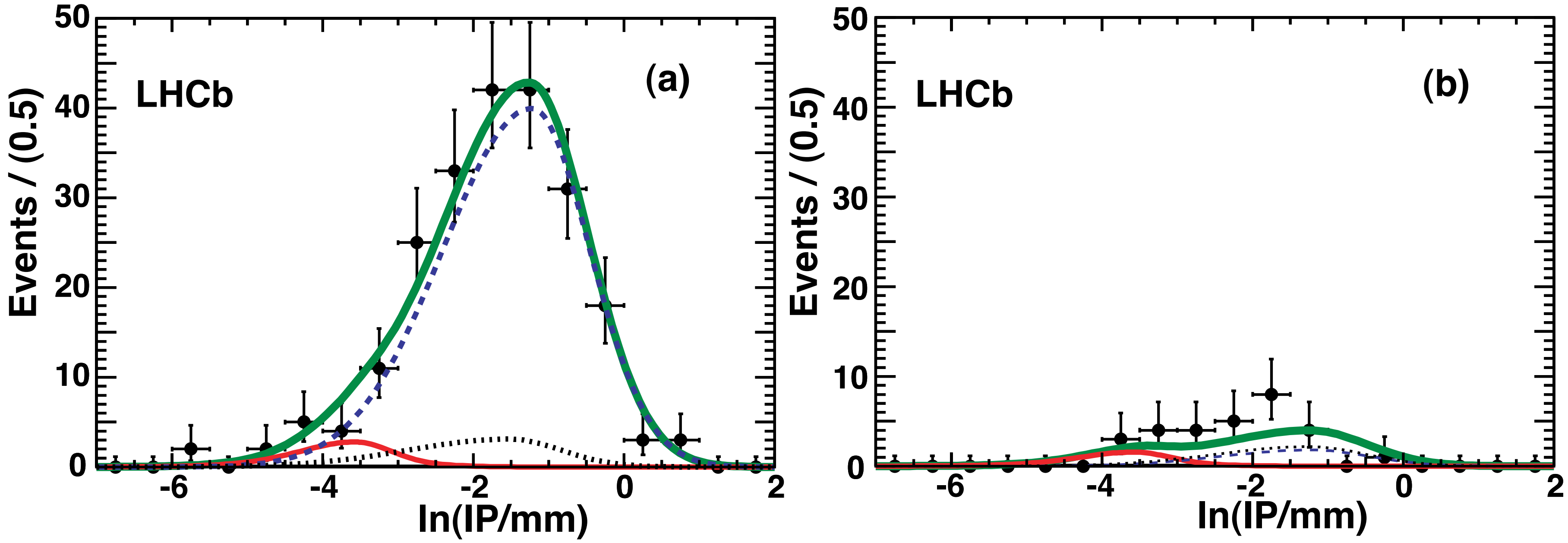
Minimum bias trigger: at least one track

$\mathcal{L} = 2.9\ nb^{-1}$

Single muon trigger: $p_T > 1.3\ GeV$

$\mathcal{L} = 12.2\ nb^{-1}$





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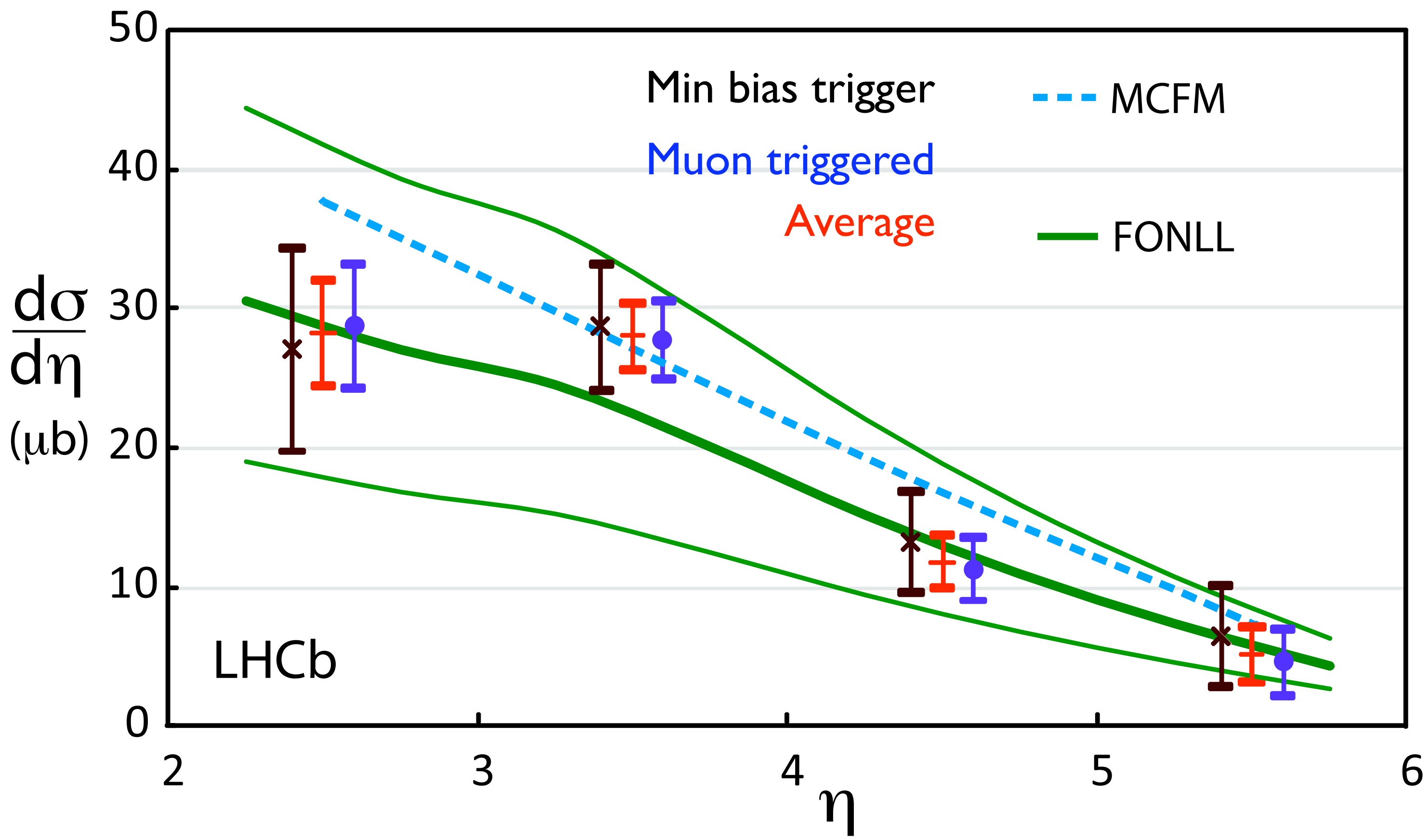
B-meson Production (LHCb)

Cross-sections and comparison with theory

$$\sigma(pp \to H_b X) = \frac{\#\text{ of detected } D^0\mu^- \text{ and } \overline{D}^0\mu^+ \text{ events}}{2\mathcal{L} \times \text{efficiency} \times \mathcal{B}(b \to D^0 X \mu^- \overline{\nu})\mathcal{B}(D^0 \to K^-\pi^+)}$$



$2 < \eta < 6$

MCFM: MSTW8NL PDF $89.0\ \mu b$

FONLL: CTEQ6.5 PDF $70.2^{+39}_{-44}\ \mu b$

LEP fragmentation functions

Full η range

MCFM: MSTW8NL PDF $332\ \mu b$

FONLL: CTEQ6.5 PDF $253^{+114}_{-96}\ \mu b$

$$\sigma(pp \to H_b X) = (75.3 \pm 5.4 \pm 13.0)\ \mu\text{b}$$

Tevatron frag. functions $(89.6 \pm 6.4 \pm 15.5)\ \mu b$

$$\sigma(pp \to b\bar{b}X) = (284 \pm 20 \pm 49)\ \mu\text{b}$$

Tevatron numbers raise cross-section by 19%

Fragmentation Fraction Ratios (LHCb)

$$B^0 \to D^-\pi^+,\ B^0 \to D^-K+,\ B^0_s \to D^-_s\pi^+ \qquad \mathcal{L} = 35\ pb^{-1}$$

non-factorizable corrections

form factors

contribution from W-exchange diagrams

$B^0 \to D^- K^+$

$$\frac{f_d}{f_s} = 12.88 \times \frac{\tau_{B_s}}{\tau_{B_d}} \times \left[\mathcal{N}_a \mathcal{N}_F \frac{\epsilon_{D_s\pi}}{\epsilon_{D_dK}} \frac{N_{D_dK}}{N_{D_s\pi}}\right]$$

$$\frac{f_s}{f_d} = 0.242 \pm 0.024^{\text{stat}} \pm 0.018^{\text{syst}} \pm 0.016^{\text{theor}}$$

$B^0 \to D^- \pi^+$

$$\frac{f_d}{f_s} = 1.018 \times \frac{\tau_{B_s}}{\tau_{B_d}} \times \left[\tilde{\mathcal{N}}_a \mathcal{N}_F \mathcal{N}_E \frac{\epsilon_{D_s\pi}}{\epsilon_{D_d\pi}} \frac{N_{D_d\pi}}{N_{D_s\pi}}\right]$$

$$\frac{f_s}{f_d} = 0.249 \pm 0.013^{\text{stat}} \pm 0.020^{\text{syst}} \pm 0.025^{\text{theor}}$$

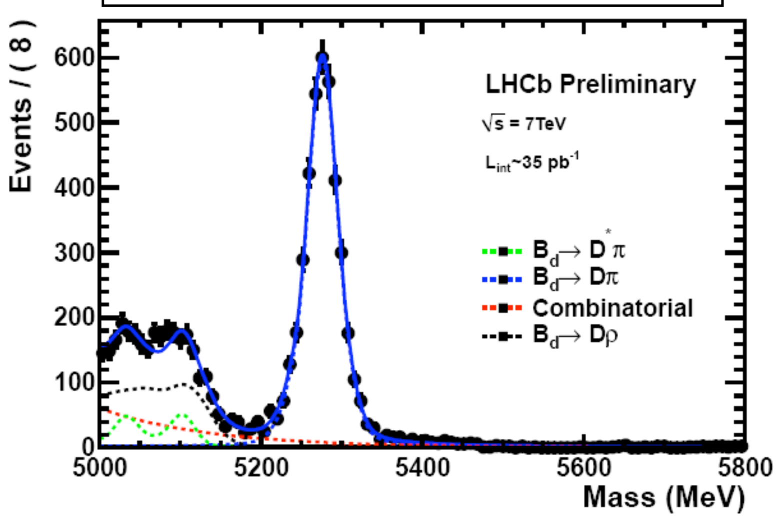
Combined:

$$\frac{f_s}{f_d} = 0.245 \pm 0.017^{\text{stat}} \pm 0.018^{\text{syst}} \pm 0.018^{\text{theor}}$$

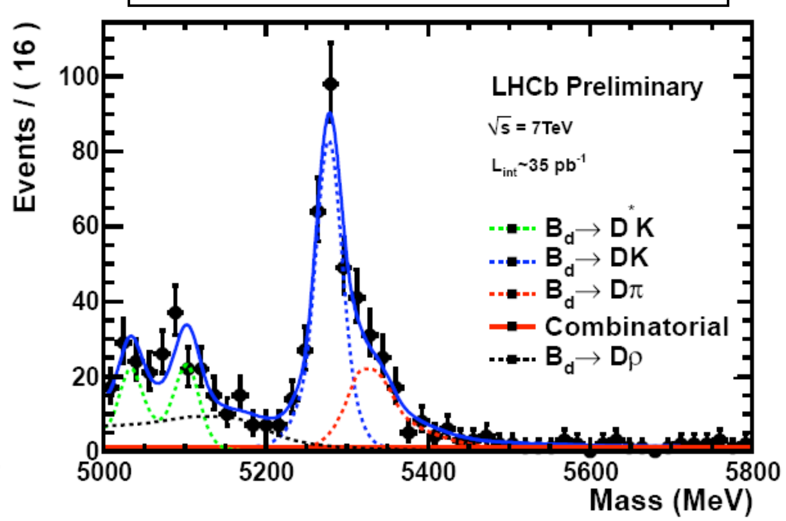
(LHCb preliminary)

Multivariate selection
Likelihood fit to $m(KK\pi\pi)$

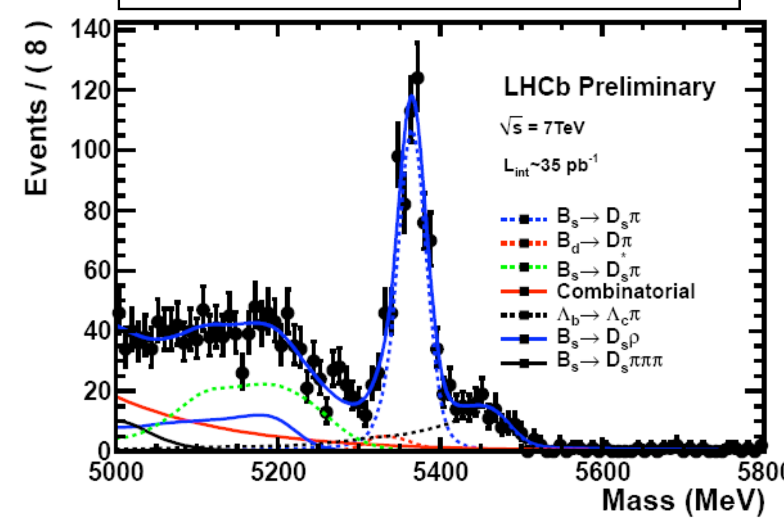
$N(B^0 \to D^-\pi^+) = 4109 \pm 75$



$N(B^0 \to D^-K^+) = 253 \pm 21$



$N(B_s^0 \to D_s^-\pi^+) = 670 \pm 34$



from Niels Tuning's talk at Beauty 2011

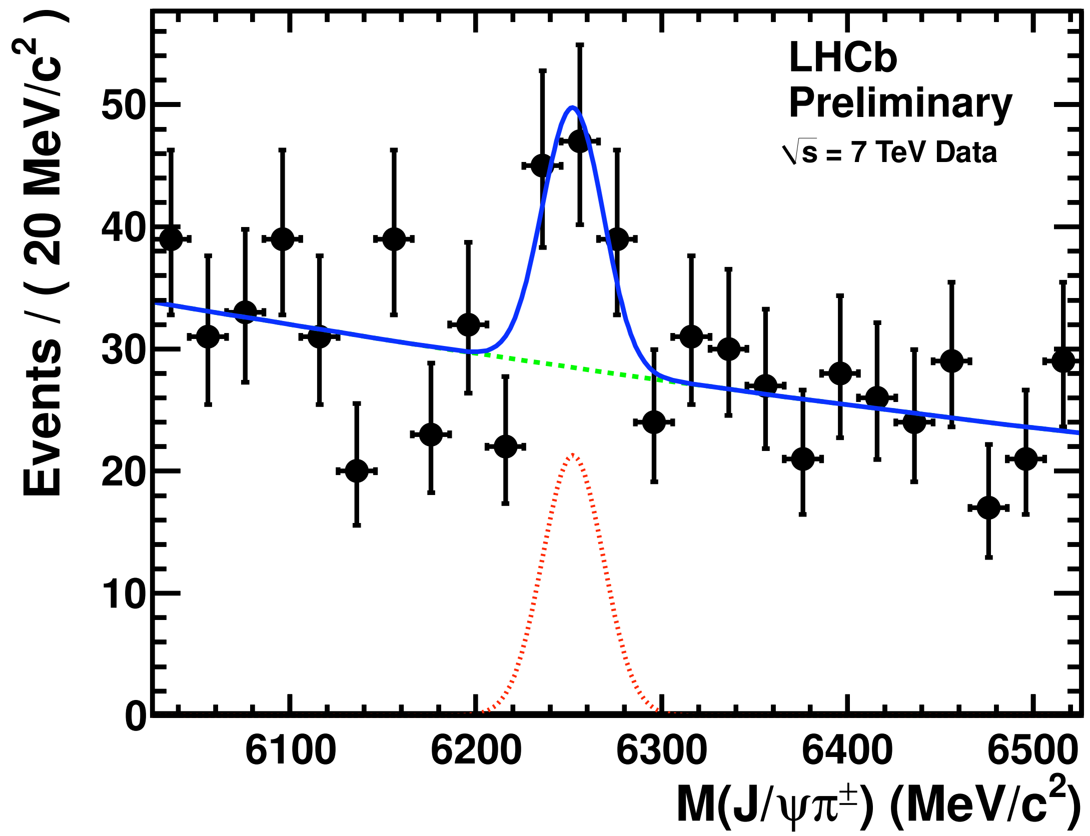
LHCb-CONF-2011-013

$B_c^{\pm}$ Production (LHCb)

$p_T^B > 4\ GeV$ $\qquad 2.5 < \eta^B < 4.5$ $\qquad \mathcal{L} = 32.5\ pb^{-1}$

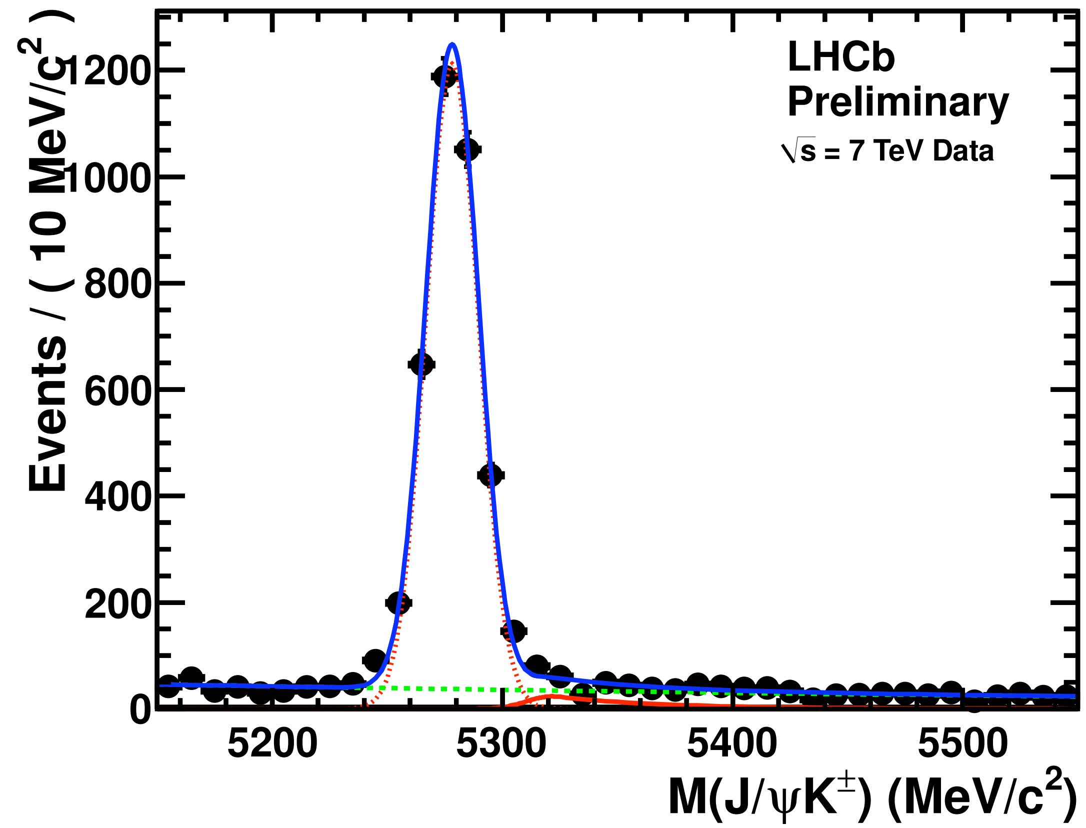
$B_c^{\pm} \to J/\psi\pi^{\pm}$

$N_{\text{sig}} = 43 \pm 13$



$B^{\pm} \to J/\psi K^{\pm}$

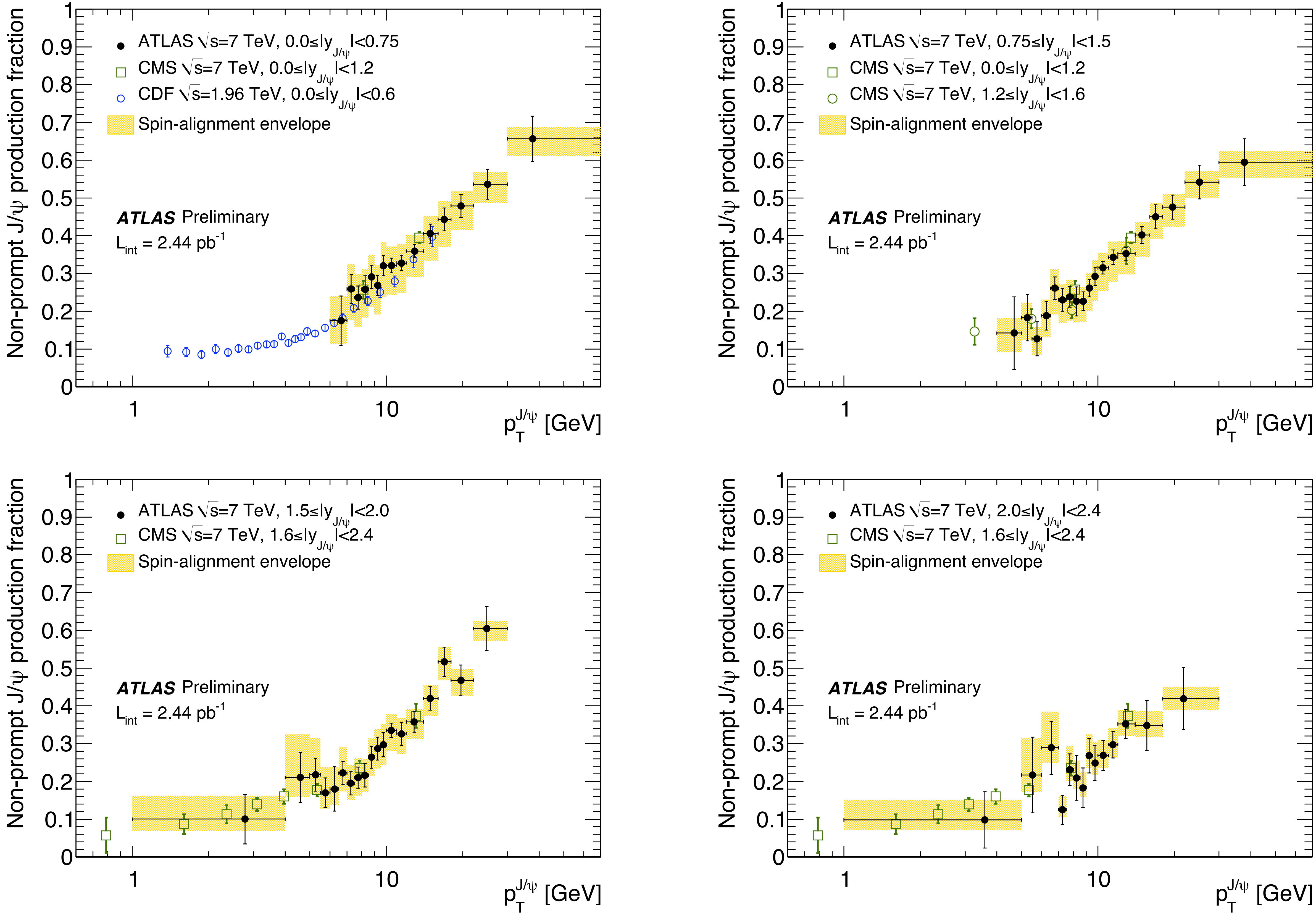
$N_{\text{sig}} = 3476 \pm 62$



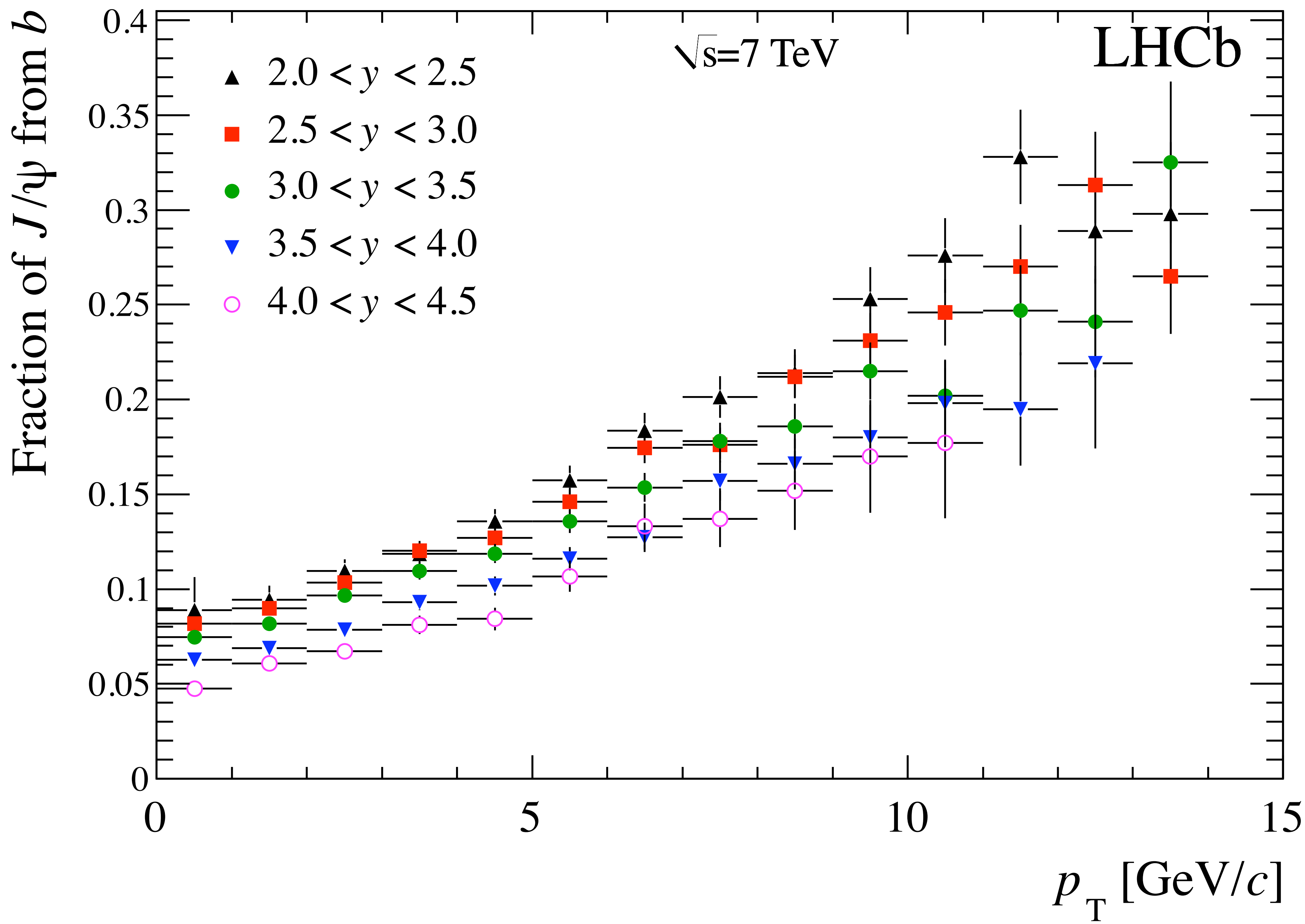
$$\mathcal{R} = \frac{\sigma(B_c^{\pm}) \times BR(B_c^{\pm} \to J/\psi\pi^{\pm})}{\sigma(B^{\pm}) \times BR(B^{\pm} \to J/\psi K^{\pm})} = 2.2 \pm 0.8\ (stat) \pm 0.2\ (syst)\ \%$$

from Jibo HE's talk at Beauty 2011

B Fraction from Inclusive J/ψ Production



B Fraction from Inclusive J/ψ Production

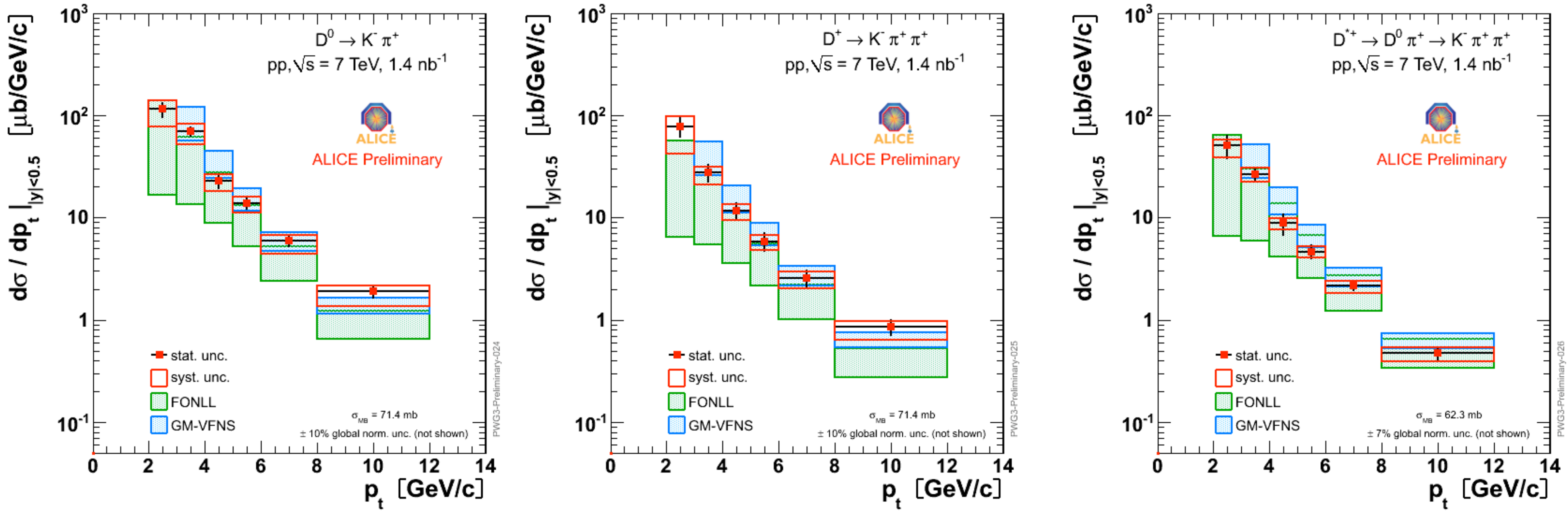


For analyses details see next talk

Some Results from ALICE

D meson production in pp

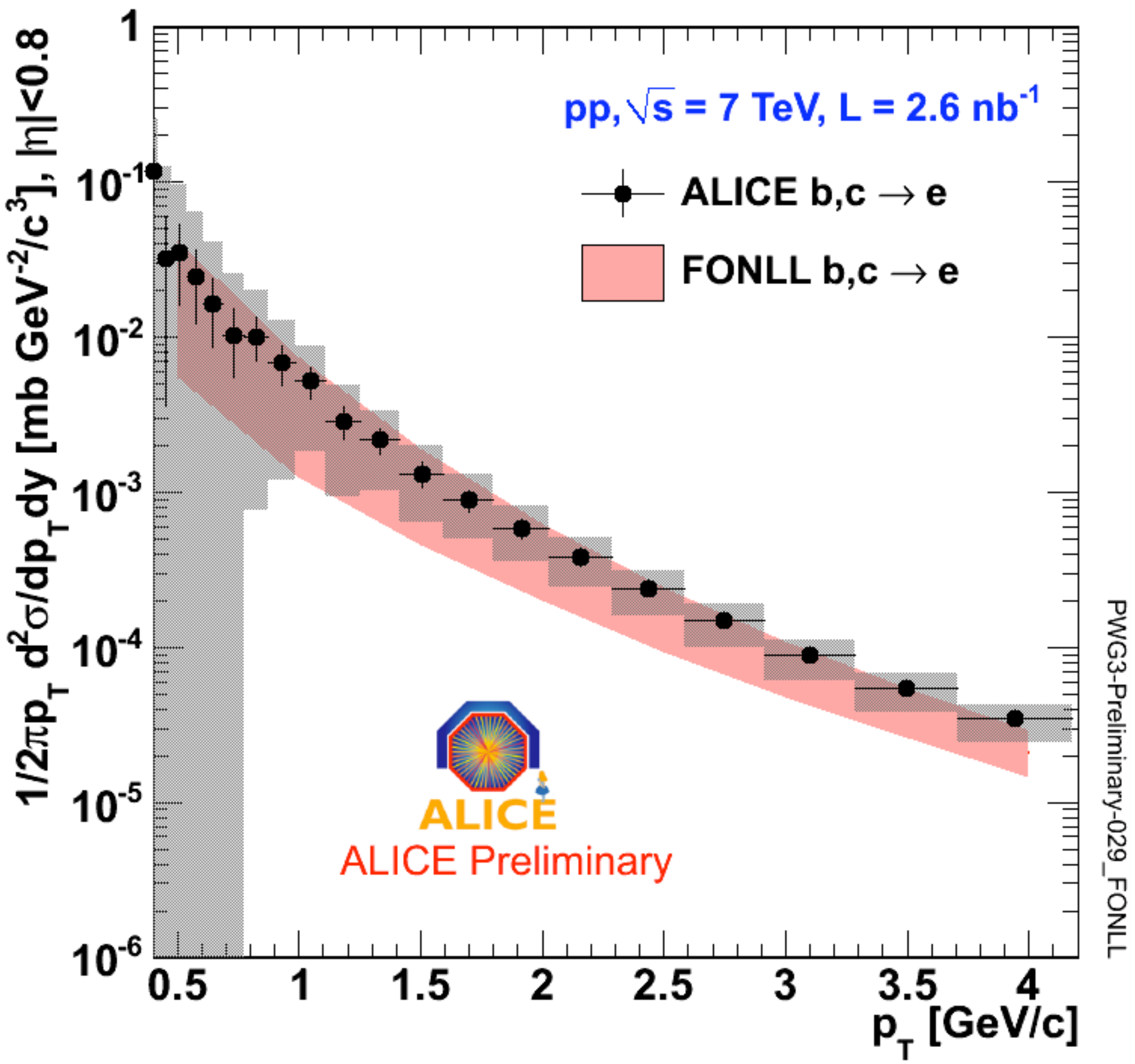
Preliminary cross sections (with 10^8 m.b. events): D^0, D^+, D^*



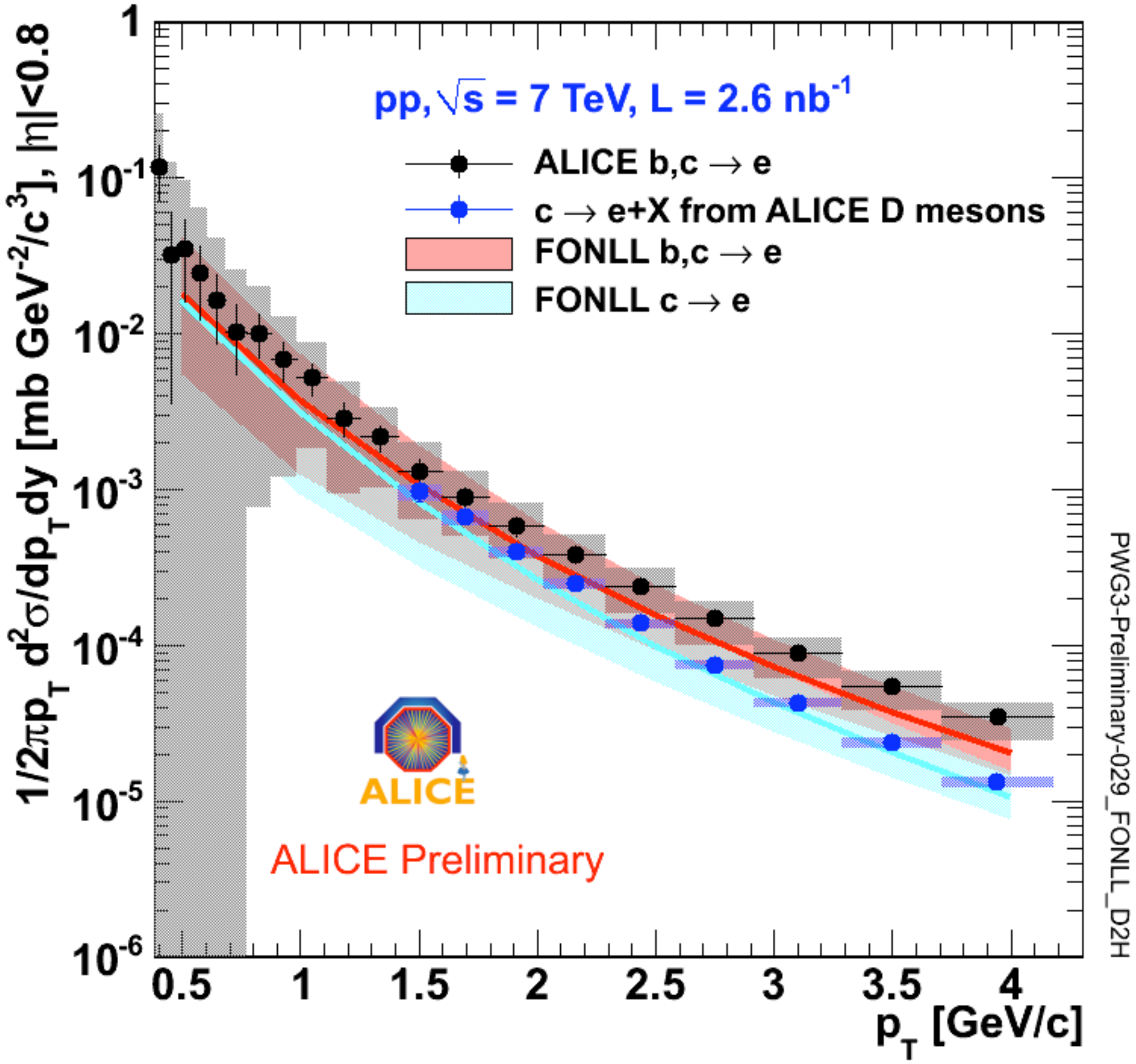
pQCD predictions (FONLL and VFNS) describe the data

Electrons from HF decay in pp

- 1.6×10^{8} m.b. events
- Subtract background cocktail from data
- Cross section of electrons from charm and beauty decays in $|\eta|<0.8$
- pQCD FONLL prediction describes well
- Outlook: extend to higher p_t (beyond 10 GeV/c) using electron ID in TRD and EMCAL



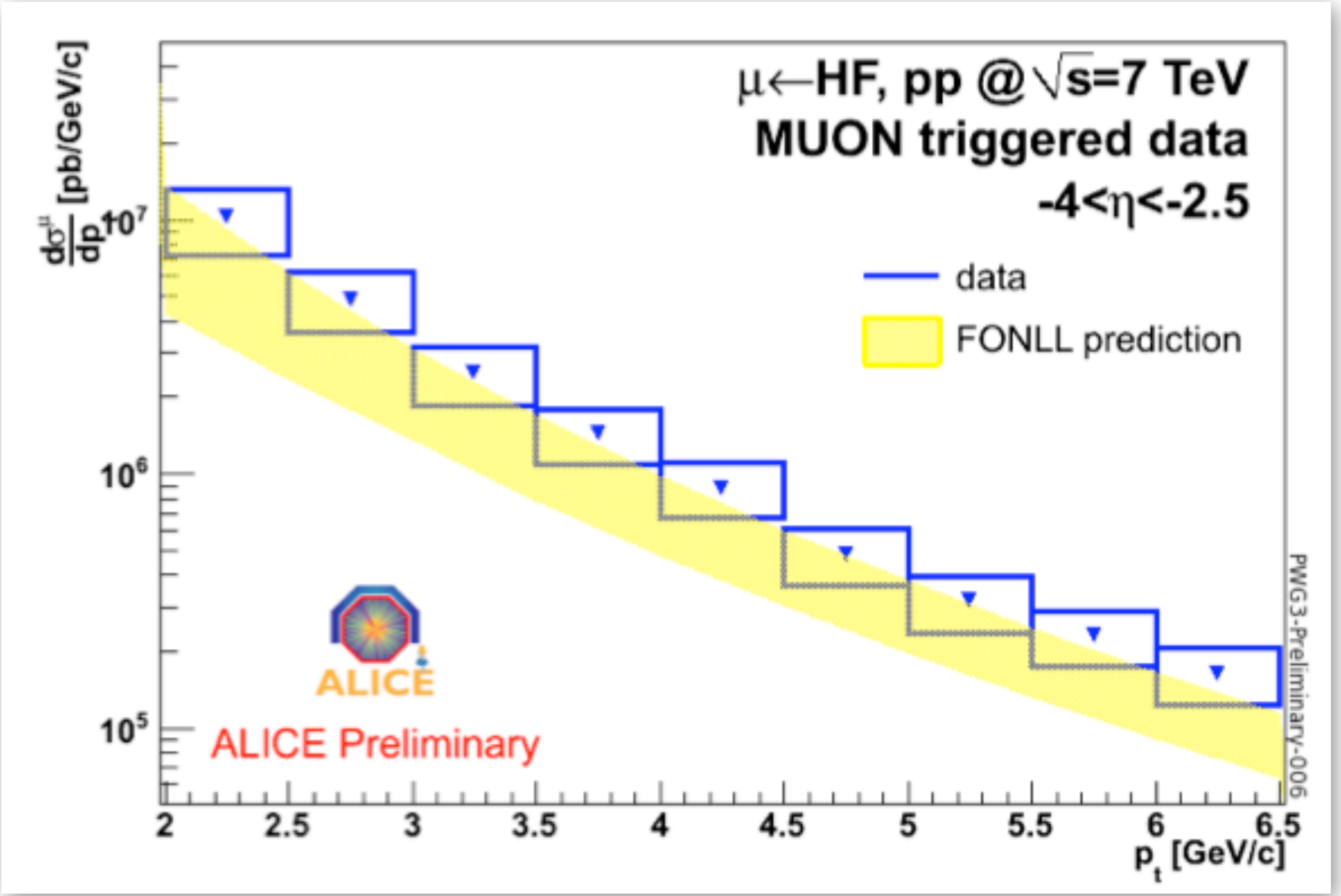
ALICE's charm and beauty, pp



Good agreement at low p_t (charm dominant) between electrons from HF and electrons obtained by "decaying" the D meson cross sections

ALICE heavy flavours in the muon channel at forward y

- High quality track in the muon tracking system;
- Matching with muon trigger system remove most of secondaries about pT=2 GeV;



Muons from heavy flavour also agree with pQCD FONLL predictions.