Studies of B+ mass and lifetime performance with 13 TeV pp data: preparations and status

Артём Маевский

МГУ им. М. В. Ломоносова

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Мотивация

RUN1

2

2012	signals	Lumi, fb-1	signals /1fb-1	Precision of lifetime after 1fb-1	Precision of lifetime after 100 pb-1
Bd-J/ψK0*			23k	12 fs	38 fs
Bs-J/ψphi	78805	14.9	5k	26 fs (single tau)	82 fs (single tau)
B+J/ψK+ B-J/ψK- both	563k ± 2k 553k ± 2k 1, 116k ± 3k	19.5	 57k	not measured yet projection from Bd: 8 fs	not measured yet projection from Bd 24 fs
L2StarB bias	bias due to d0(mu) < 3mm	14.9		9 fs	
L2StarA bias	Run A, B, part of C bias due to mistake	4		70 fs	

- 100 pb-1 enough to discover biases ~ 30 fs and bigger

Thursday, 16 April 2015

Действующие лица

CONF-BPHY-2015-02 13 TeV Bplus performance [See details]

Phase 1: Active Studies of B+ mass and lifetime performance with 13 TeV pp data [Edit]

Leading Group: BPHY

Other Groups:

Subgroup: BPHY-jpsi

Creation Date: 2015/06/17

Temp RefCode: CONF-BPHY-2015-02

Analysis Team: Adam Edward Barton,Alastair Dewhurst,Andrew Mark Wharton,Artem Maevskiy,Darren Price,Maria Smizanska,Pavel Reznicek

Contact Editors: Adam Edward Barton,Alastair Dewhurst,Darren Price,Maria Smizanska,Pavel Reznicek

Editorial board: Andreas Korn,Pawel Bruckman de Renstrom,Stefano Rosati

EdB Chair: Andreas Korn

Egroups: atlas-conf-bphy-2015-02-editorial-board, atlas-conf-bphy-2015-02-editors

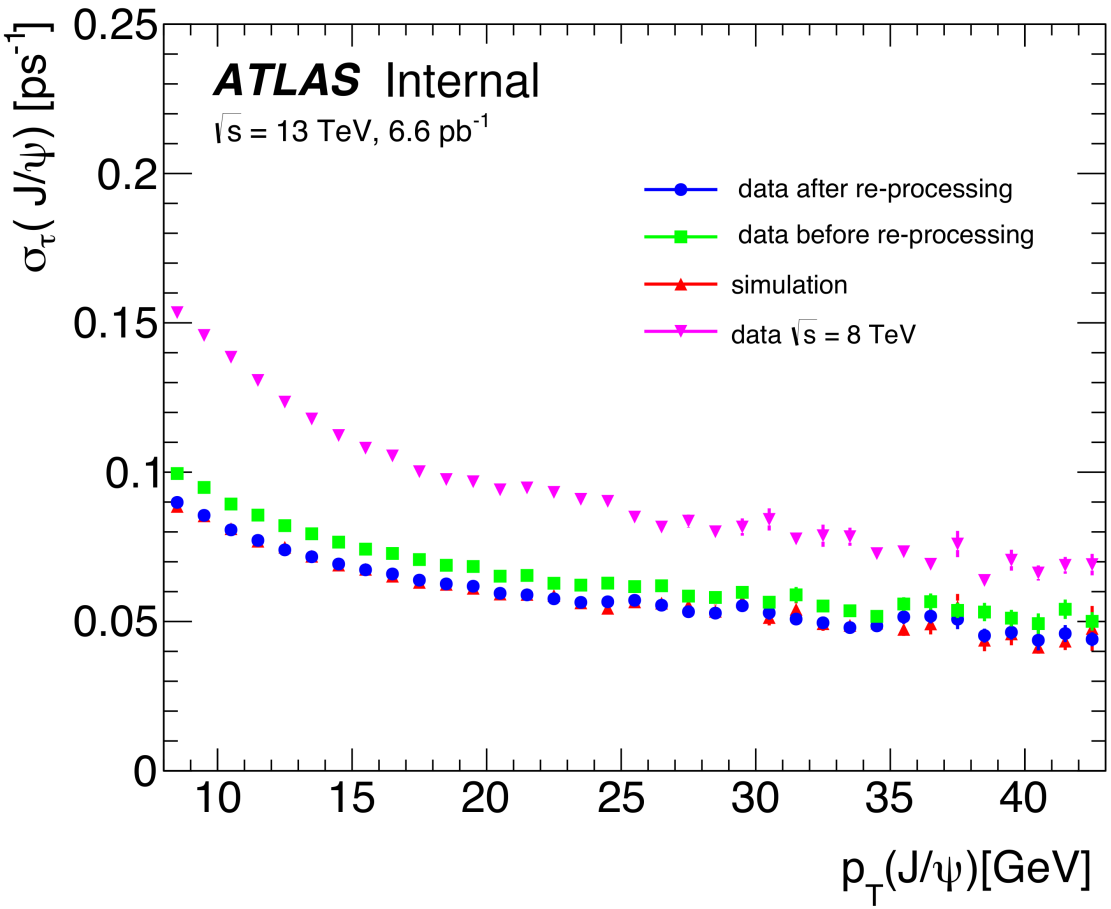
Новая инфраструктура ATLAS SW

- xAOD и DxAOD (Derivation Framework)
  - Отдельный derivation ≈на каждый анализ (в данном случае BPHY2)
  - Централизованное создание DxAOD
- RootCore (обработка DxAOD)
  - Легкий (по сравнению с ATHENA) фреймворк
  - Простой туториал:
    `https://twiki.cern.ch/twiki/bin/viewauth/AtlasComputing/SoftwareTutorialxAODAnalysisInROOT`

B+ software на данный момент

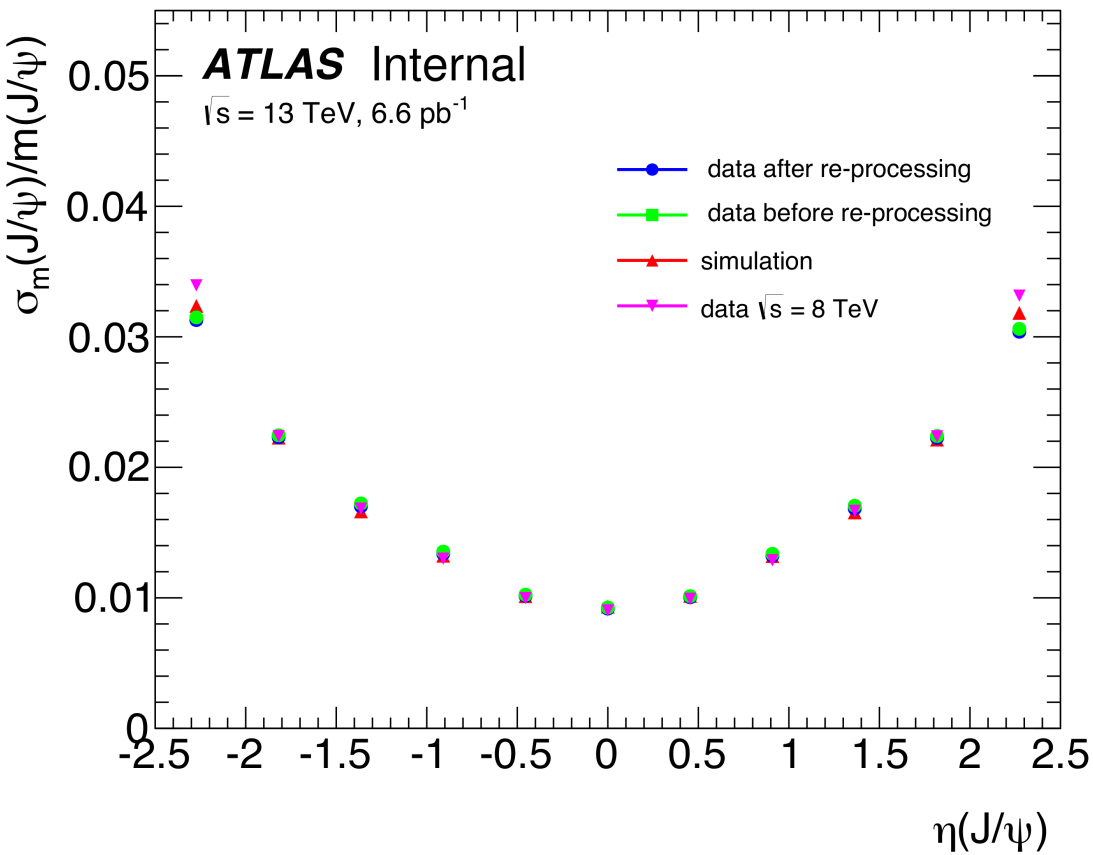
- Обновлен пакет JpsiUpsilonTools (JpsiFinder, JpsiPlus1Track)
- Написаны «оберточные» инструменты (wrapper tools, пакет DerivationFrameworkBPhys) для внедрения JpsiFinder и JpsiPlus1Track в Derivation Framework
- Конфигурационный скрипт (DerivationFrameworkBPhys/share/BPHY2.py)
- RootCore пакет для создания ntuple
- Mass-lifetime fit code

RUN2 vs RUN1



Average per-candidate error of the pseudo-proper-decay time of J/ψ(μμ) as a function of J/ψ transverse momentum p_T

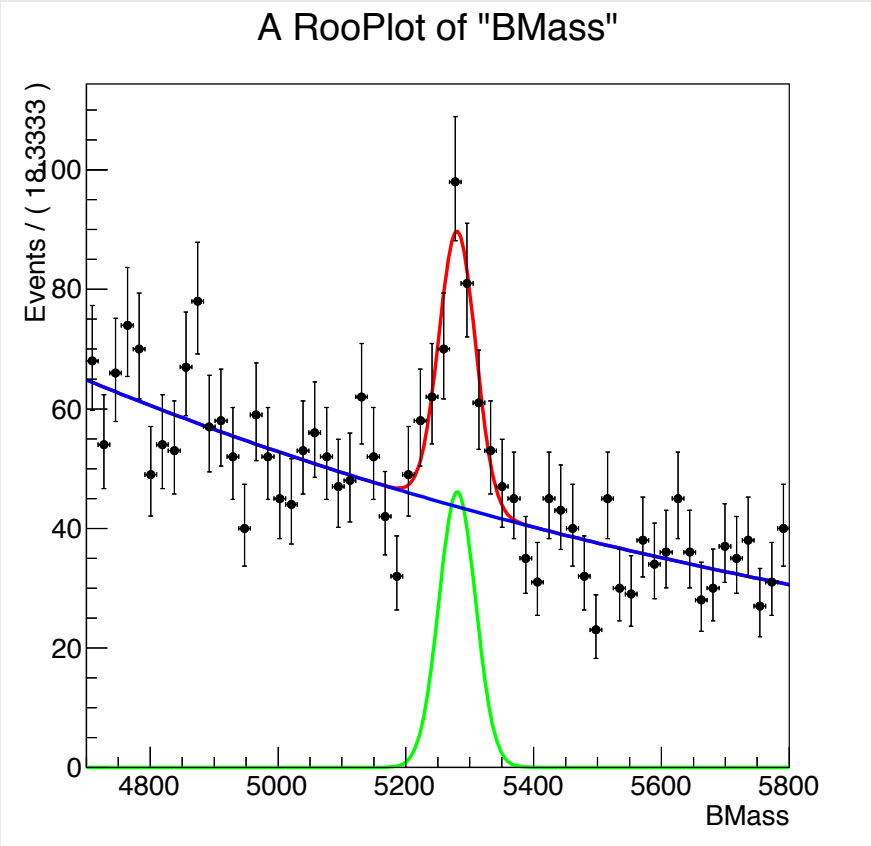
RUN2 vs RUN1



Average per-candidate error of invariant mass of J/ψ(μμ) divided by mass of J/ψ(μμ) as a function of J/ψ pseudo-rapidity η

Первые результаты

Softer cuts: Chi2<10, pTK>2GeV + smalest A0 distance to PV



Fit:
signal 1-Gauss
background expo

NO.	NAME	VALUE	ERROR
1	BackgroundMassSlope	-6.83352e-04	6.16518e-05
2	SignalFraction	6.18126e-02	8.84738e-03
3	SignalMassMean	**5.28045e+03**	**4.38796e+00**
4	SignalMassSigma	**2.85920e+01**	4.79609e+00

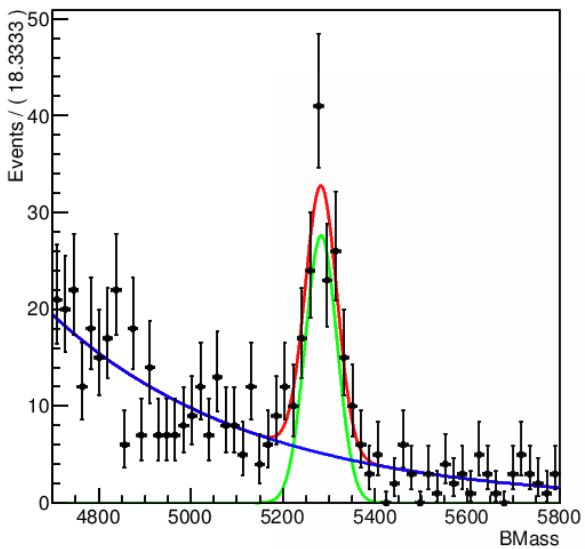
PDG 5279.26 ± 0.17
Our fit 5280.45 ± 4.39

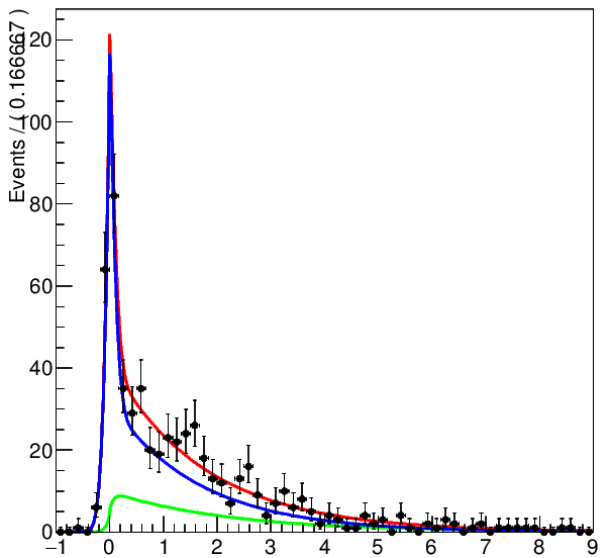
Первые результаты

Lancaster University

B^+ lifetime 2015

- We have a very rough B^+ lifetime fit using 2015 data. We should soon have a better system for extracting the data and will be able to work on the fit





Спасибо