



# Status of Quarkonium DataBase Working with Hepdata

EVO meeting - 6th May 2010

J. Castillo, R. Granier de Cassagnac, G. Martinez, S. Porteboeuf, F. Prino.

# OUTLINE

- ★ Summary of past discussions
- ★ Summary of Durham visit
- ★ Update of Hepdata database : work organization
- ★ Publication
- ★ Conclusions

# Physics working group

## « DataBase on Quarkonium results »

Conveners: Javier Castillo, Sarah Porteboeuf, Francesco Prino

Our goal is to produce a database of existing experimental data about Quarkonia

Subjects:

- Existing database in experimental high energy and nuclear physics;
- Selection of Quarkonium results;
- Guide-lines for model comparison with experimental data.

➡ For the DataBase : HEPDATA

➡ Publication « Data review tag in IOP»

# First step : bibliography for experimental results

On the TWIKI of ReteQuarkonii: <https://twiki.cern.ch/twiki/bin/view/ReteQuarkonii>

Item : ReteQuarkonii Activities,  
Quarkonium related references in hadronic collisions for the database  
on Quarkonium experimental results

Or directly with : <https://twiki.cern.ch/twiki/bin/view/ReteQuarkonii/BibliographyList>

On this page you will find:

- A list of bibliography on Quarkonium results, grouped by experiment, with clickable link when exists
- For each experiment : a reference name from the network
- A bibtex file with all references for Latex use

# First step : bibliography for experimental results

- RHIC (PHENIX, STAR) 21 papers
- HERA-B, 12 papers
- SPS (NA3, NA38, NA51, NA50, NA60, NA10?), 24 papers
- Fermilab (E866, E789, E772), 14 papers
- Tevatron (CDF, D0?), 24 papers

A total of 95 references

Different energies

Different systems (pp, NN, pN)

Different observables about Quarkonia

Any comments, suggestion, missing reference ?

# HEPDATA Database

<http://hepdata.cedar.ac.uk/>

Database in high energy physics, existing, updated and user friendly

## What's new in HEPDATA?

- ❑ Webpage design

- ❑ Technical aspects

The HepData Reaction Database has recently moved from its former hierarchical database, with its in-house BDMS management system, to a new relational system using MySQL and modern Java based tools. This will allow better long-term management of the project and also improved searching and display facilities.

- ❑ Search interface (Form Search)

- ❑ Plot comparison much more efficient

# Summary of Durham visit

Mike Whalley enthusiast to enter the Quarkonia project and helps us update the HEPDATA Database

- Structure of the database on papers, one input file (.dat) per papers, with data points and key words for identification.
- Each data we want to put inside, we will have to write the corresponding file.
- Some of data already in the database (need to be verified)
- Presentation as data review (item)

# Presentation of data as a Quarkonia Review

HepData Reviews - Mozilla Firefox

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http://hepdata.cedar.ac.uk/reviews

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HepData Reviews

## The Durham HepData Project

REACTION DATABASE • DATA REVIEWS • PARTON DISTRIBUTION FUNCTION SERVER • OTHER HEP RESOURCES

### HepData Data Reviews

The following data reviews are available:

- Structure Functions in DIS IoP IoP
- Single Photon Production in Hadronic Interactions IoP
- Two-Photon Reactions leading to Hadron Final States IoP IoP
- Drell-Yan cross sections IoP
- Energy-Energy Correlations in  $e^+e^-$  interactions
- Inclusive particle production data in  $e^+e^-$  Interactions IoP
- Hadronic Total Cross Sections (R) in  $e^+e^-$  Interactions IoP
- Low Energy Neutrino Cross Sections
- Event Shapes in Lepton-Lepton and Lepton-Nucleon Interactions

IoP indicates a published version is available in the IoP Journal of Physics G.

HepData also maintains the UK mirrors of: SPIRES, HEP & PDG

We want to have Quarkonia data review as an item.

In preparation, the Quarkonia webpage :

<http://durpdg.dur.ac.uk/hepdata/online/quarkonii/index.html>



# Presentation of data as a Quarkonia Review

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http://durpdg.dur...rkonii/index.html

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HEPDATA ON-LINE DATA REVIEW  
**A Review of Quarkonii Data in Hadronic Interactions.**  
 HEPDATA ON-LINE DATA REVIEW

**CONTENTS**

**Experiments**

BNL-RHIC

PHENIX STAR  
HERA-B

CERN-SPS

NA3 NA10  
NA38 NA50  
NA51 NA60

Fermilab-Tevatron

CDF D0  
E772 E779  
E866

CERN-LHC

CMS ATLAS  
ALICE LHCb

**Initial States**

p(bar)-p  
p-d d-d  
p-A d-A  
ALICE LHCb

**Initial States**

p(bar)-p  
p-d d-d  
p-A d-A  
A-A  
meson-p(N)

**Measurements**

Cross Sections

Total  
Differential(Y)  
Differential(PT)

**An up-to-date archive of Quarkonii data in Hadronic Interactions**

**data from a specific experiment**

BNL-RHIC	HERA	CERN-SPS	Fermilab-Tevatron	CERN-LHC
<a href="#">PHENIX</a> <a href="#">STAR</a>	<a href="#">HERA-B</a>	<a href="#">NA3</a> <a href="#">NA10</a> <a href="#">NA38</a> <a href="#">NA50</a> <a href="#">NA51</a> <a href="#">NA60</a>	<a href="#">CDF</a> <a href="#">D0</a> <a href="#">E772</a> <a href="#">E789</a> <a href="#">E866</a>	<a href="#">CMS</a> <a href="#">ATLAS</a> <a href="#">ALICE</a> <a href="#">LHCb</a>

**data for a specific initial state**

<a href="#">(anti)proton-proton</a>	<a href="#">proton-deuteron</a>	<a href="#">proton-nucleus</a>
<a href="#">deuteron-nucleus</a>	<a href="#">nucleus-nucleus</a>	<a href="#">meson-</a>

**data for a specific measurement**

Cross Sections	Properties	Final States
<a href="#">Total</a> <a href="#">Differential-PT</a> <a href="#">Differential-Rapidity</a> <a href="#">Differential-X</a>	<a href="#">Branching Ratios</a>	<a href="#">J/PSI</a> <a href="#">PSI</a> <a href="#">CHI/C</a> <a href="#">Upsilon</a> <a href="#">D/D*</a> <a href="#">Charm</a> <a href="#">Beauty</a>

**3 presentations :**

- By experiment
- By initial state
- By observable

Can be discussed ...

To send any comments on this service please use [feedback](#)

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# Presentation of data as a Quarkonia Review

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HEPDATA  
ON-LINE  
DATA  
REVIEW

## A Review of Quarkonii Data in Hadronic Interactions.

HEPDATA  
ON-LINE  
DATA  
REVIEW

### CONTENTS

#### Experiments

BNL-RHIC

[PHENIX](#) [STAR](#)

[HERA-B](#)

CERNS-PS

[NA3](#) [NA10](#)

[NA38](#) [NA50](#)

[NA51](#) [NA60](#)

Fermilab-Tevatron

[CDF](#) [D0](#)

[E772](#) [E779](#)

[E866](#)

CERN-LHC

[CMS](#) [ATLAS](#)

[ALICE](#) [LHCb](#)

Initial States

[p\(bar\)-p](#)

[p-d](#) [d-d](#)

## Data from the HERA-B Collaboration

The individual links display the specific datasets.

The publication reference link displays the SPIRES hep database entry.

The [R] link displays the complete entry for that paper from the HepData Reaction database.

- Abt et al. [EPJ C26\(2003\)345](#) [R]
  - - pA (C,Ti) 41.6 GeV SIG [2] [1]
- Abt et al. [PL B638\(2006\)407](#) [R]
  - - pA (C,Ti,W) 41.6 GeV SIG [1] [2] [3]
  - - pA (C,Ti,W) 41.6 GeV DSIG/DYRAP [4]

Data sorted with:

Link to paper (spires)

Link to the full Hepdata data record

Link to direct tables/plots

# What we need to do now

- Verify existing data record
- Create files for new record
- Discuss the Quarkonia review presentation
- For each papers, key word for Quarkonia review presentation
- When will be finished, need also people as beta-tester



# The job

Create/verify file.dat, name= IRN number, updated on TWIKI

Cf example file (4807.dat), and with explanation (format don't support comment)

```
SC = AAD 10; RED = 4807;
R = CERN-PH-EP/2010-004; TY = PREP; D = MAR 2010;
DES = Encoded 17 MAR 2010 by MRW;
CR = CERN-LHC. Measurement of the charged particle multiplicity and
its dependence on pseudorapidity and transverse momentum in P P collisions
at a centre-of-mass energy of 900 GeV. The data were taken during the period
December 2009 with an approximate total integrated luminosity of 9 mb-1 and
cover the pseudorapidity range -2.5 to 2.5 with charged particle transverse
momenta > 0.5 GeV. ;
CR.= Numerical values supplied by G. Brandt.;
IRN = 8591806;
DE = ATLAS;
EXP = CERN-LHC-ATLAS;
DBNAME = DI;

TFP = P 15(C=PREPRINT);
CT = Average value of charged particle multiplicity per event
and unit of pseudorapidity in the pseudorapidity range from
-0.2 to 0.2;
RE = P P --> CHARGED X;
OBS = MULT;
PLAB = 431770,431770;
N = RE; V = P P --> CHARGED X;
N = SQRT(S) IN GEV; V = 900;
N = PT(P=3) IN GEV; V = > 0.5;
N = YN; V = (1/N)*(D(N)/DETARAP;
N = ETARAP(P=3);
*F V.; Y.;*
0.0 (BIN=-0.2 TO 0.2); 133 +- 0.003 (DSYS=0.040);
*CF *
```

General information

First data set

# Information for data review webpage

IRN	RED	Experiment	Initial state	FSP	OBS
4188497	4457	Fermi - E866	pN (pBe, pFe, pW)	J/Psi, Psi'	Cross section (power_alpha)=f(x_F)   (power_alpha)=f(p_T) missing in the database
4499042	4593	Fermi- E866	pN (pCu)	Upsilon(1s), Upsilon(2s+3s)	polarization=f(p_T, x_F)
7427387	4751	Fermi- E866	pH, pd	Upsilon(1s,2s,3s)	cross section: dsig/dp_T, dsig/dx_F
E866 missing paper : IRN 56256027					
2860015	4251	Fermi-E789	pN (pCu, pBe)	J/Psi	cross section: dsig/dx_F   power_alpha=f(x_F) missing in the database
2907631	no red	Fermi-E789	pN (pBe, pAu)	D	cross section : power_alpha=f(<x_F>, <p_T>),   dsig/dtau, dsig/dp_T
3087840	4290	Fermi-E789	pN (pAu)	b->j/Psi->mu+mu-	cross section: dsig/dx_fd/2p_T
3130991	7044	Fermi-E789	pN (pAu)	J/Psi, Psi'	cross section: dsig/dx_F, dsig/dp_T, dsig/dy
3127230	7039	Fermi-E789	pN (pBe, pC, pW)	j/Psi	cross section: power_alpha=f(x_F, p_T)   R(C/Be), R() W/Be,   power_alpha=f(x_2) missing in the database
E789 missing paper IRN 2952050					

# Publication

Hepdata has a collaboration with IOP, Journal of physics G to publish data review.

Mike will contact them to see if they are still interested.

Can publish the data review with them, some guidelines.

What do we exactly want to put in this publication?

Should we wait for first LHC results on quarkonia?

Last minute, Mike talk with the IoP editorial board of the J Phys G :

“His feeling is that these are better on-line with the review being more words about the data and theory with comparison plots etc.. He also suggested a topical review rather than the 'data' review we had done previously.”

# Conclusions

- ❑ Quarkonium review webpage in preparation, will be updated with incoming data.
  
- ❑ Need people to share the work of updating the database.  
(deadline July?)
  
- ❑ Project of publishing a data review, in discussion.
  - Format/Content ?
  - Title?