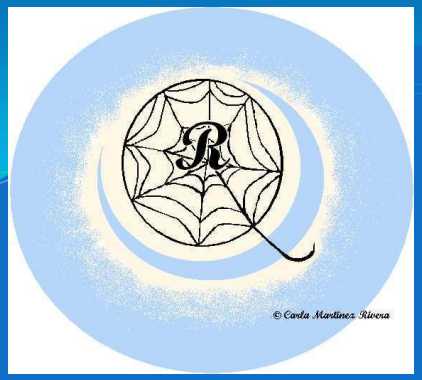


Status of Quarkonium DataBase

RQW 2010

Nantes – 25-28 October 2010

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

OUTLINE

- Summary on Bibliography list on Quarkonium related data and existing reviews on Quarkonium
- Description of HEPDATA
- Status of the project and ongoing developments
- Conclusions

ReteQuarkonii Network

https://twiki.cern.ch/twiki/bin/view/ReteQuarkonii

Retequarkonii is a networking of the I3 Hadron Physics program of the EU 7th FP. Retequarkonii aims at studying the production of quarkonia in hadronic collisions at ultra relativistic energies.

About 27 research groups of 12 different countries participate to the Retequarkonii project.

The duration of the Retequarkonii project is 30 months, starting on January 1st 2009 (end June 30th 2011).

Retequarkonii will organize one training school for PhD and two conferences between experimentalists and theorists, and it will create a database on Quarkonia experimental results.

ReteQuarkonii Network

Organization : 5 working group

Physics Working Group "Cold nuclear matter effects"
Conveners: Raphael Granier de Cassagnac & Enrico Scomparin

Physics Working Group "Hot nuclear matter effects"
Conveners:Anton Andronic & Philippe Crochet

Physics Working Group "Soft and hard diffraction at LHC"
Conveners: Rainer Schicker & Krysztof Piotrzkowski & Joakim Nystrand

Phyiscs Working Group "Open Heavy Flavours"
Conveners: Silvia Masciocchi & Andrea Dainese

Physics Working Group "DataBase on Quarkonia results"
Conveners: Javier Castillo & Sarah Porteboeuf & Francesco Prino

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

Bibliography of 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
  - RHIC (PHENIX, STAR) 21 papers
  - HERA-B, 12 papers
  - SPS (NA3, NA38, NA51, NA50, NA60,NA10), 24 papers
  - Fermilab (E866, E789, E772), 14 papers
  - Fermilab-Tevatron (CDF, D0), 34 papers
  - As soon as LHC data will be published, they will be included

See talks by F.Fleuret and R. Granier de Cassagnac on tuesday

See talk by R. Arnaldi and E. Scomparin on Tuesday

See talk by F. Arléo, S. Peigné on Tuesday

See talk by S. De Cecco just after on CDF

Several talks from 4-LHC experiments among the workshop

- For each experiment : a reference name from the network
- A bibtex file with all references for Latex use

NEWS : UA1/UA6

Few days ago, we noticed that UA1 and UA6 have been forgotten.

- UA1 : 6 papers

  - Albajar et al., *"Beauty production at the CERN p anti-p collider",* PL 256B,121, (1990), IRN 2298198.
  -Albajar et al., *"J / psi and psi-prime production at the CERN p anti-p collider"*, PL 256B,112 (1991), IRN 2271184
  - Albajar et al., *"Measurement of the Bottom Quark Production Cross-Section in Proton - anti-Proton Collisions at s**(1/2) = 0.63-TeV"*, PL 213B,405 (1988), IRN 1893440
  - Albajar et al., *"High transverse momentum J/Psi production at the CERN proton – anti-proton collider"*, PL 200B,380 (1988), IRN 1759256
  -Albajar et al., *"Low mass dimuon production at the CERN proton – anti-proton collider"* , PL 209B,397,(1988), IRN 1822233
  - Arnisson et al., *"Intermediate mass dimuon events at the CERN p anti-p colliderI at s**(1/2) = 540-GeV"*, PL 155B,442 (1985), IRN 1331604.

- UA6 : 1 paper

  - Morel et al., " *Measurement of the inclusive J / psi production cross-sections in anti-p p and p p collisions at s**(1/2) = 24.3-GeV "*, PL 252B,505 (1990), IRN 2262711.

GOOD NEWS, all the 7 papers already in HEPDATA

BibliographyList < ReteQuarkonii < TWiki - Mozilla Firefox
Edit View History Bookmarks Tools Help
cern.ch https://twiki.cern.ch/twiki/bin/view/ReteQuarkonii/BibliographyList
Most Visited Getting Started Latest Headlines Gmail : la messagerie ... laposte.net
BibliographyList < ReteQuarkonii < ...
Jump
Search

On this page you will find a list of bibliography on Quarkonia Results, compiled by Retequarkonii members and an associated bibtex file (Bibliography_List.bib)

- **RHIC** (Raphaël Granier De Cassagnac)
  - PHENIX (http://www.phenix.bnl.gov/WWW/talk/pub_papers.php)
    1. *J/Psi Production in Au-Au Collisions at sqrt(s_NN) = 200 GeV at the Relativistic Heavy Ion Collider*, S.S. Adler, et al (the PHENIX Collaboration), Phys.Rev.C69:014901,2004, http://xxx.lanl.gov/abs/nucl-ex/0305030, (J/psi en Au+Au, 13 coups (expert = Michel, papier obsolète, remplacé par les suivants))
    2. *J/psi production from proton-proton collisions at sqrt(s) = 200 GeV*, PHENIX Collaboration, S.S. Adler, et al, Phys.Rev.Lett.92:051802,2004, http://xxx.lanl.gov/abs/hep-ex/0307019, (J/psi en p+p (expert = Raphaël, papier obsolète, remplacé par les suivants))
    3. *J/psi Production and Nuclear Effects for d+Au and p+p Collisions at sqrt(s_NN) = 200 GeV*, PHENIX Collaboration, S.S. Adler, et al, Phys.Rev.Lett.96:012304,2006, http://arxiv.org/abs/nucl-ex/0507032, (J/psi en d+Au et p+p (expert = Raphaël, papier obsolète, remplacé par les suivants))
    4. *J/psi Production vs Centrality, Transverse Momentum, and Rapidity in Au+Au Collisions at sqrt(s_NN) = 200 GeV*, PHENIX Collaboration, A. Adare, et al, http://arxiv.org/abs/nucl-ex/0611020, (J/psi Au+Au (expert = Raphaël ou Hugo, Ermias et ViNham étant partis))
    5. *J/psi Production vs Transverse Momentum and Rapidity in p+p Collisions at sqrt(s) = 200 GeV*, PHENIX Collaboration, A. Adare, et al, http://arxiv.org/abs/hep-ex/0611020, (J/psi en p+p (pas vraiment d'expert dans le coin, mais Raphaël peux faire l'affaire))
    6. *J/psi Production in sqrt (s_NN)= 200 GeV Cu+Cu Collisions*, PHENIX Collaboration: A. Adare, et al, http://arxiv.org/abs/0801.0220, (J/psi en Cu+Cu (expert = Andry))
    7. *Cold Nuclear Matter Effects on J/Psi as Constrained by Deuteron-Gold Measurements at sqrt(s_NN) = 200 GeV*, PHENIX Collaboration, A. Adare, et al, Phys.Rev.C77:024912,2008, Erratum-ibid.C79:059901,2009. , http://arxiv.org/abs/0711.3917, ((erratum http://arxiv.org/abs/0903.4845), J/psi en dAu (expert = raphaël))
    8. *Photoproduction of J/psi and of high mass e+e- in ultra-peripheral Au+Au collisions at sqrt(s_NN) = 200 GeV*, PHENIX Collaboration, A. Afanasiev, et al, http://arxiv.org/abs/0903.2041, (J/psi en collisions ultrapériphérique (expert = Zaida)).
  - PHENIX open charm

Bibliography on existing reviews on Quarkonia

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

Item : ReteQuarkonii Activities,
Existing reviews on Quarkonia

Or directly with : https://twiki.cern.ch/twiki/bin/view/ReteQuarkonii/ReviewBibliography

On this page you will find:

- Bibliography list on existing reviews on Quarkonia, ordered by year of publication.
- 17 references from 1999 to 2009

HEPDATA DATABASE

- One database already exists in high energy physics : HEPDATA

  http://durpdg.dur.ac.uk/

- "Particle physics scattering data in the form of differential and total cross sections, structure functions, polarisations, etc., from a wide range of reactions is available in the REACTION DATA database."

- "This is compiled by the Durham HEP Database group with additional input COMPAS (Russia) group. The database is regularly updated."

- "Literature searching (including citations) is provided in the form of a "mirror" of the comprehensive and highly popular SLAC-SPIRES HEP database, compiled by the SLAC library staff in collaboration with the DESY Library. Updates are obtained nightly from SLAC and the database updated automatically in the early hours of each morning."

The Durham HepData Project

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

Reaction Database Standard Search Interface

Search directly in the DataBase

Database of Numerical HEP scattering cross sections

Enter query: Search

examples: re gamma gamma; re p p --> p p and obs sig exp cern

Search Help — Output Help — Form Search — Browse Keywords — NEW Latest LHC DATA

To search the database: Enter your query command comprising keyword-value pairs joined with Boolean ANDs. A null entry will retrieve all records.

The basic keywords are:

reac - the reaction (eg. p p --> charged x) also **beam** and **fsp**
obs - the observable (eg. SIG, DSIG/DX, DN/DPT)
sqrts - lower bound of the centre-of-mass energy in GeV
exp - the experiment/laboratory name (eg. ZEUS, CERN, LHC)
date - the year of the publication/preprint
auth - the first author name on the paper

Or use data reviews on specified subjects

Quick link to HepData data reviews

- Structure functions in DIS
- Single photon production in hadronic interactions
- Two-photon reactions leading to hadron final states
- Drell-Yan cross-sections
- Inclusive particle production data in e+ e- interactions
- Hadronic total cross-sections (R) in e+e- interactions
- Low-energy neutrino cross-sections
- Event shapes in lepton-lepton and lepton-nucleon interactions

Predefined event shape / jet searches

- Event shapes (thrust, etc...)
- Event shapes in e+e- collisions
- Event shapes in non-e+e- collisions
- Jet production (in any process)
- Jet production in e+e- collisions
- Jet production in non-e+e- collisions

HepData Reaction Database Display Full Paper - Mozilla Firefox
Fichier Édition Affichage Historique Marque-pages Outils ?
http://hepdata.cedar.ac.uk/hepdata/DisplayFullPaper?irn=4372&number=1&string=re Au Au
Les plus visités Gmail laposte.net eBay Viamichelin PriceMinister - Achat ... Materiel.net Petites annonces grat...

Durham University **HepData Reaction Database**

Au-Au, RHIC, PHENIX, 130 GeV

Mid-rapidity transverse energy distribution

ADCOX 01 - Experiment BNL-RHIC-PHENIX - Detector/Collaboration **PHENIX**
Published in **PRL 87,052301**, Preprinted as **NUCLEX-0104015** (RED=4653)
Measurement of the mid-rapidity transverse energy distribution from s(NN)**(1/2) = 130-GeV Au + Au collisions at RHIC

Display the Full Data Record | Display List of Tables | Display the Spires Record | Back
Display current list of selected plots

BNL-RHIC. Measurement of the mid-rapidity transverse energy distribution from sqrt(s_NN) 130 GeV AU+AU collisions at RHIC.

Additional Systematical Errors and Comments						
Variable	SYS-ERR	INCLUDED?	QUALIFIER 1		QUALIFIER 2	
D(ET)/D(ETARAP)	4.5 PCT	NOT INCLUDED	-	-	-	-
Overall systematic uncertainty						

Comments

Table: 1
130 GeV is sqrt(S) per nucleon-nucleon collision. The statistical errors are negligible and only systematic errors are quoted. COL(NAME=CENTRALITY) is centrality
Location: T I

.	ETARAP(P=3) : 0 (BIN=-0.5 TO 0.5)
.	RE : AU AU --> CHARGED X

Terminé

HepData Reaction Database Display Full Paper - Mozilla Firefox
Fichier Édition Affichage Historique Marque-pages Outils ?
http://hepdata.cedar.ac.uk/hepdata/DisplayFullPaper?irn=4372&number=1&string=re Au Au
Les plus visités Gmail laposte.net eBay Viamichelin PriceMinister - Achat ... Materiel.net Petites annonces grat...

D(ET)/D(ETARAP)	4.5 PCT	NOT INCLUDED	-	-	-	-
Overall systematic uncertainty						

Table: 1

130 GeV is sqrt(S) per nucleon-nucleon collision. The statistical errors are negligible and only systematic errors are quoted. COL(NAME=CENTRALITY) is centrality

Location: T I

.	ETARAP(P=3) : 0 (BIN=-0.5 TO 0.5)
.	RE : AU AU --> CHARGED X
.	SQRT(S)/A(P=1) : 130.0 GeV
COL(NAME=CENTRALITY) IN PCT	MEAN(N=D(ET)/D(ETARAP)) IN GEV
0.00 TO 5.00	503.0 +- 2.0
5.00 TO 10.0	409.0 +- 4.0
10.0 TO 15.0	340.0 +- 5.0
15.0 TO 20.0	283.0 +- 7.0
20.0 TO 25.0	233.0 +- 7.0
25.0 TO 30.0	191.0 +- 8.0
30.0 TO 35.0	154.0 +- 8.0
35.0 TO 40.0	123.0 +- 7.0
40.0 TO 45.0	98.0 +- 7.0
45.0 TO 50.0	76.0 +- 6.0
.	Numbers Plot Select Plot(?)

Table of data …

HepData is funded by the STFC(UK) and hosted at the Durham IPPP
Questions and Comments to: m.r.whalley@durham.ac.uk

Terminé

HepData Reaction Database Data Plot - Mozilla Firefox

Fichier Édition Affichage Historique Marque-pages Outils ?

http://hepdata.cedar.ac.uk/hepdata/ReactionPlot?string=re Au Au&xscale=lin&yscale=lin&hepid=4372&dsid=1&xid=1&yid=1&sy:

Les plus visités Gmail laposte.net eBay Viamichelin PriceMinister - Achat ... Materiel.net Petites annonces grat...

Durham University **HepData Reaction Database**

… and plot

First Author: ADCOX01
Published as: PRL 87,052301
Preprinted as: NUCLEX-0104015
Experiment Name: BNL-RHIC-PHENIX(PHENIX)

Data plot: 1/1

130 GeV is sqrt(S) per nucleon-nucleon collision. The statistical errors are negligible and only systematic errors are quoted. COL(NAME=CENTRALITY) is centrality
'MEAN(N=D(ET)/D(ETARAP)) IN GEV' versus **'COL(NAME=CENTRALITY) IN PCT'**
'ETARAP(P=3) : 0 (BIN=-0.5 TO 0.5)'
'RE : AU AU --> CHARGED X'
'SQRT(S)/A(P=1) IN GeV : 130.0'

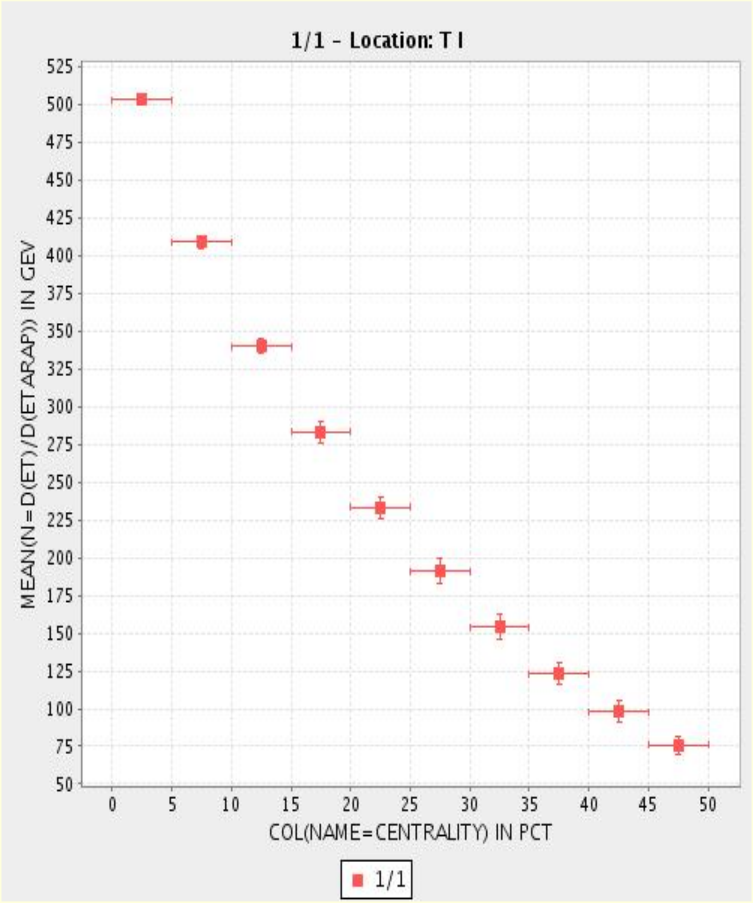
RePlot x- lin y- lin with systematics- yes

+ RePlot to save in PDF file:

Add to selected plot list

List selected plots

Go back to paper



Terminé

The Project

1) Update HEDPADATA with our Quarkonia bibliography
Every paper accesible with the direct search

2) Create a Quarkonia review with a dedicated webapge

→ The 2 objectives are done in parallele
Work in progress, deadline : end of 2010
In collaboration with Mike Whalley from HEDPDATA
http://durpdg.dur.ac.uk/hepdata/online/quarkonii/index.shtml

3) The quarkonia review will be supported by a publication

→ In discussion with J.Phys.G which support the project
Work in progress deadline : 2011

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

Experiments	
BNL-RHIC	
PHENIX	STAR
HERA-B	
CERNS-PS	
NA3	NA10
NA38	NA50
NA51	NA60
Fermilab-Tevatron	
CDF	D0
E772	E789
E866	
CERN-LHC	
CMS	ATLAS
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)	
Differential(X)	
Polarization	
Properties	

data from a specific experiment				
BNL-RHIC	HERA	CERN-SPS	Fermilab-Tevatron	CERN-LHC
PHENIX STAR	HERA-B	NA3 NA10 NA38 NA50 NA51 NA60	CDF D0 E772 E789 E866	CMS ATLAS ALICE LHCb

data for a specific initial state		
(anti)proton-proton	proton-deuteron	proton-nucleus
deuteron-nucleus	nucleus-nucleus	deuteron-deuteron
-	meson-	-

data for a specific measurement		
Cross Sections	Properties	Final States
Total Differential-PT Differential-Rapidity Differential-X Polarization	Branching Ratios	J/PSI PSI CHI/C Upsilon D/D* DiMuon Charm Beauty

Data from the E772 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.

- **Alde et al.** PRL 64(1990)2479 [R]

  Nuclear dependence of dimuon production at 800-GeV. FNAL-772 experiment

  - p p (-) 800 GeV DSIG/DM (*MU*) *v* M(P=3_4) (45) [1] *v* M(P=3_4) (54) [2] *v* M(P=3_4) (57) [3]
  - p A (Fe) 800 GeV SIG (*MU*) *v* M(P=3_4) (10) [4] *v* PT (6) [5] *v* XL (8) [6] *v* XT (9) [9]
  - p A (C) 800 GeV SIG (*MU*) *v* XT (9) [7]
  - p A (Ca) 800 GeV SIG (*MU*) *v* XT (9) [8]
  - p A (Wt) 800 GeV SIG (*MU*) *v* XT (9) [10]

- **Alde et al.** PRL 66(1991)133 [R]

  The A-dependence of J / psi and psi-prime production at 800-GeV/c

  - p A (Nucleus,D,C,Ca,Fe,Wt) 800 GeV SIG (*J/PSI*) *v* A (4) [1] *v* PT (5) [4] *v* XL (6) [6]
  - p A (Nucleus,D,C,Ca,Fe,Wt) 800 GeV SIG (*PSI*) *v* A (4) [2] *v* PT (3) [5] *v* XL (4) [7]
  - p A (Nucleus,D,C,Ca,Fe,Wt) 800 GeV POWER (*J/PSI*) *v* XL (6) [8] *v* PT (5) [10] *v* X2 (6) [12]
  - p A (Nucleus,D,C,Ca,Fe,Wt) 800 GeV POWER (*PSI*)

Experiments
BNL-RHIC
PHENIX | STAR
HERA-B
CERNS-PS
NA3 | NA10
NA38 | NA50
NA51 | NA60
Fermilab-Tevatron
CDF | D0
E772 | E789
E866
CERN-LHC
CMS | ATLAS
ALICE | LHCb
Initial States
p(bar)-p
p-d | d-d
p-A | d-A
A-A

Data for P_DEUT interactions

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.

E866

- **Zhu et al.** PRL 100(2007)062301 [R]

  Measurement of Upsilon production for p+p and p+d interactions at 800-GeV

  - - p deut (-) 800 GeV DSIG/DXL (*UPSI*) *v* XL (6) [1]
  - - p deut (-) 800 GeV DSIG/DPT**2 (*UPSI*) *v* PT**2 (7) [3]

E772

- **McGaughey et al.** PR D50(1994)3038 [R]

  Cross-sections for the production of high mass muon pairs from 800-GeV proton bombardment of H-2

  - - p deut (-) 800 GeV D2SIG/DM/DXL (*MU*) *v* M (17) [1] *v* M (17) [2] *v* M (18) [3] *v* M (12) [4]
  - - p deut (-) 800 GeV DSIG/DXL (*MU*) *v* XL (6) [7]
  - - p deut (-) 800 GeV DSIG/DPT (*MU*) *v* PT (11) [8]
  - - p deut (-) 800 GeV E*D3SIG/DP**3 (*MU*) *v* PT (16) [5] *v* PT (11) [6]

Achievement

Creation of a Quarkonium review with a dedicated webapge

http://durpdg.dur.ac.uk/hepdata/online/quarkonii/index.shtml

111 references considered [including D0 (9 papers), UA1 (6 papers) and UA6 (1 papers)]

50% done

56 papers online, verified, accessible via the dedicated webpage

22% in achievement

- 5 papers transmitted to Hepdata, but still not online
- Work done by the network collaborators but still need to be checked before sending to HEPDATA (4 papers)
- 16 Papers already in the database, just need verifications : SPS (NA38/51/50+UA1/6)

72% are either finished or on its way

28% Still to be done + look for eventual missing papers

Conclusions

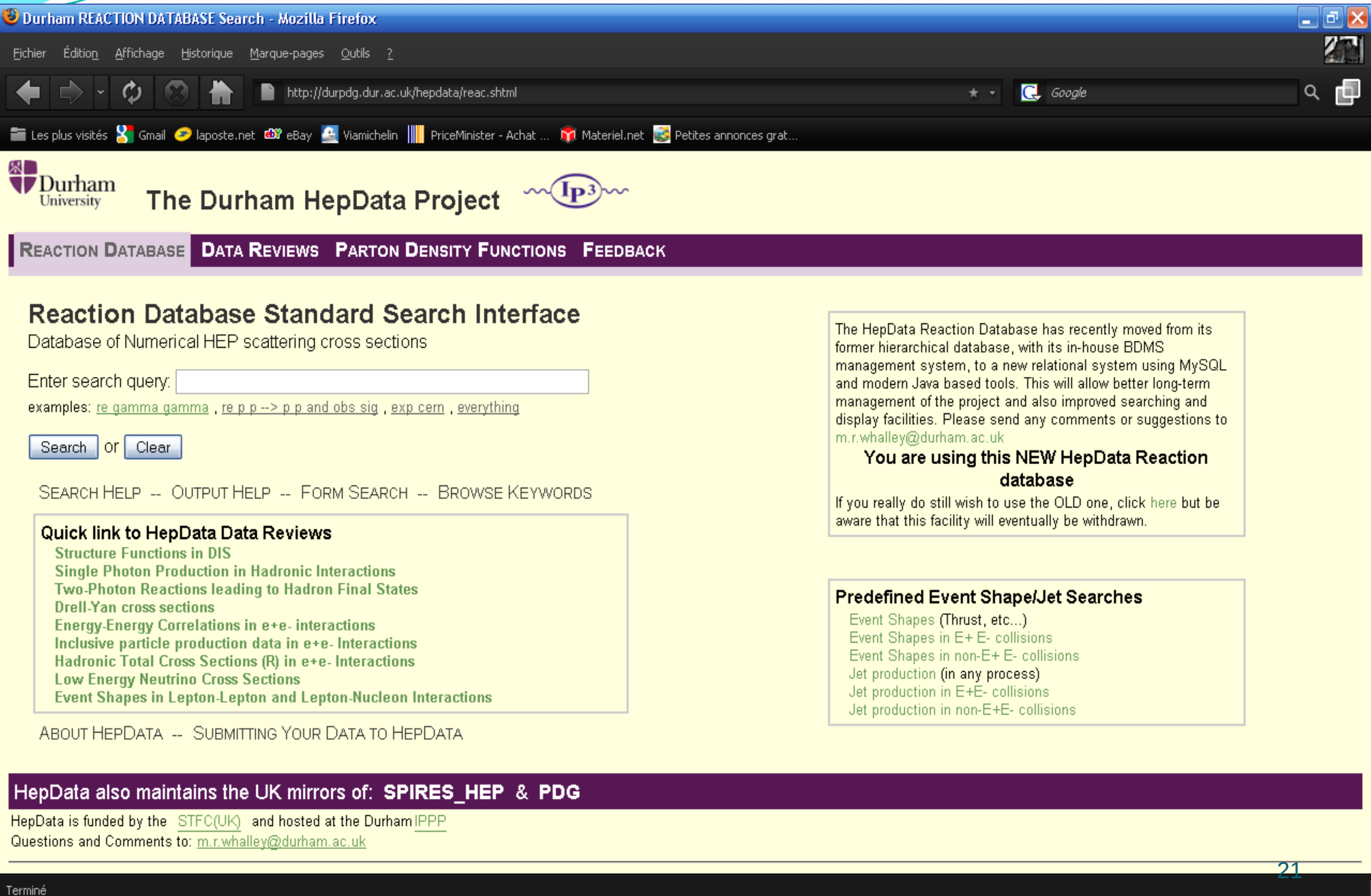
✓ The physics working group “DataBase on Quarkonium results” in the ReteQuakonii network.

✓ List of bibliography on Quarkonium results and existing reviews, everything on TWIKI.
https://twiki.cern.ch/twiki/bin/view/ReteQuarkonii/BibliographyList

✓ Project for updating HEPDATA with our bibliography, and creating a data review on quarkonium, in progress : 70% of the work is done, deadline end of 2010
http://durpdg.dur.ac.uk/hepdata/online/quarkonii/index.shtm

✓ Project of publishing a data review with J.Phys.G., in progress, deadline 2011.

Direct search in the Reaction Database



Example of search

HepData Reaction Database Search Result - Mozilla Firefox

Fichier Édition Affichage Historique Marque-pages Outils ?

http://hepdata.cedar.ac.uk/hepdata/reactionquery?string=re+Au+Au&plength=10&start=1

Les plus visités Gmail laposte.net eBay Viamichelin PriceMinister - Achat ... Materiel.net Petites annonces grat...

Durham University **HepData Reaction Database**

Back to the REACTION DATABASE or the HEPDATA top page

Database: **HEPDATA REACTION DATABASE (New Version)**
Search Command: **re Au Au**
Result: **21** documents found (displaying **1** to **10**)
First | Previous | Next | Last

Reaction Au-Au: 21 documents

Data related to a publication

re Au Au Submit Modified Search

Display current list of selected plots

1 KLAY 03 - Experiment BNL-E-895 - Detector/Collaboration
Published in **PR C68,054905**, Preprinted as **Not Known**
"Charged pion production in 2 to 8 agev central au+au collisions"
Full Data Record | List of Tables | Spires Record

2 BACK 02 - Experiment BNL-917 - Detector/Collaboration
Published in **PR C66,054901**, Preprinted as **Not Known**
"Proton emission in Au+Au collisions at 6-GeV/nucleon, 8-GeV/nucleon, and 10.8-GeV/nucleon"
Full Data Record | List of Tables | Spires Record

3 ADLER 02 - Experiment BNL-RHIC-STAR - Detector/Collaboration **STAR**
Published in **PR C66,061901**, Preprinted as **NUCL-EX/0205015**
"K*(892)0 production in relativistic heavy ion collisions at S(NN)**(1/2) = 130-GeV"
Full Data Record | List of Tables | Spires Record

Terminé