

# The Durham HepData Project



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

# HepData status

HepData also maintains the UK mirror of the PDG

Contact Us

HepData is funded by the UK STFC and hosted at the Durham IPPP  
Please send questions and comments to [hepdata@projects.hepforge.org](mailto:hepdata@projects.hepforge.org)



Mike Whalley - IPPP Durham UK

DASPOS/DPHEP7 Workshop  
21-22nd March 2012  
CERN

The Durham HepData Project

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### Reaction Database Standard Search Interface

Database of Numerical HEP scattering cross sections

Enter query:

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

[Search Help](#) — [Output Help](#) — [Form Search](#) — [Browse Keywords](#) — [Label 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 beams and fep.
- obs - the observable (eg. SIG, DSIG/CK, DNOFT).
- 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.
- ref - the publication/preprint reference.

Use % as the right or left truncation character to search for values beginning or ending with the value. All searches are case-insensitive. More details are in the Search Help

**Quick link to HepData data reviews**

- Quarkonia data in hadronic interactions
- Structure functions in DIS
- Single photon production in hadronic interactions
- Two-photon reactions leading to hadron final states
- Orbit-Van cross-sections
- Inclusive particle production data in e+e- interactions
- Hadronic total cross-sections (TD) 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

[About HepData](#) — [Submitting your data to HepData](#)

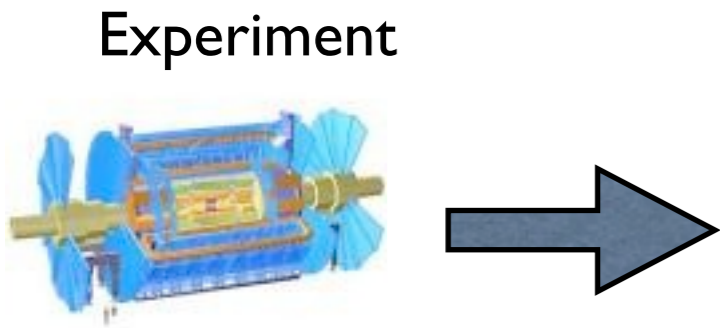
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Contact Us

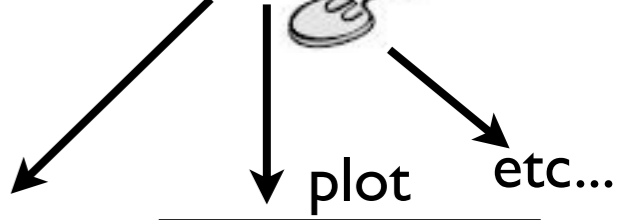
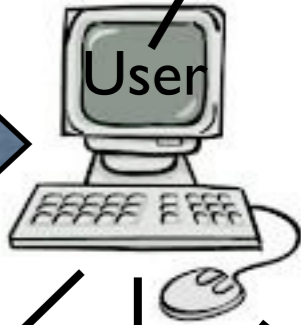
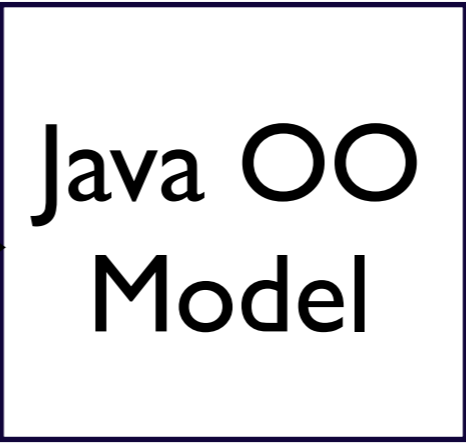
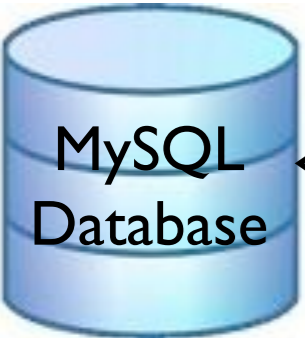
# Brief Introduction to HepData

- **Aim** - to compile published 'cross section' data and make them available in a computer database
- **Small group**, based at IPPP, Durham U. (UK) - DBmanager/physicist+non-physicist assistant
- **STFC(UK) funded** - just received funding to October 2016.
- **> 30 years**, began in collaboration with PDG - original DB management system BDMS
- **2009 moved** to more modern and long-term maintainable computing system based on MySQL and Java code - CEDAR



Java-Hibernate  
Object-relational mapping library  
relational database <==> OO model

Apache-Tapestry  
open-source component  
oriented Java web  
application framework



# HepData - 'standard' record type

## Reaction Database Full Record Display

View short record or as: [plain text](#), [AIDA](#), [PyROOT](#), [YODA](#), [ROOT](#), [mpl](#) or [jhepwork](#)

### AAD 2011 — Measurement of inclusive jet and dijet production in pp collisions at $\sqrt{s} = 7$ TeV using the ATLAS detector

Experiment: [CERN-LHC-ATLAS \(ATLAS\)](#)  
 Preprinted as [CERN-PH-EP-2011-192](#)  
 Archived as: [ARXIV:1112.6297](#)  
 Record in: [INSPIRE](#)

CERN-LHC. Measurements of the inclusive jet and di-jet cross sections in proton-proton collisions at a centre-of-mass energy of 7 TeV. The analysis is based on the 2010 data sample with a total integrated luminosity of 37 pb<sup>-1</sup>. The anti-KT algorithm is used for jet clustering with data given using both the parameters R=0.4 and R=0.6. Double-differential cross sections are given as a function of the inclusive jet PT in rapidity (y) bins and of the di-jet invariant mass in bins of half of the rapidity separation of the two jets (y\*). Details of the systematic errors and their correlations are given in the link below. In the tables the first (sys) error is the correlated (in PT) systematic error and the second is the uncorrelated systematic error, both produced by combining the relevant errors in quadrature.

[Details of systematic errors and their correlations](#)

[View list of currently selected plots](#)

Total number of tables: 32. Displaying: 1 to 10. [First](#) | [Previous](#) | [Next](#) | [Last](#)

#### Table 1

as: [plain text](#), [AIDA](#), [PyROOT](#), [YODA](#), [ROOT](#), [mpl](#) or [jhepwork](#)

Inclusive jet PT distribution for the |y| range 0.0-0.3 and R=0.4.  
 Location: T 5, F 9  
 Additional systematic error: ± 3.4% (luminosity uncertainty)

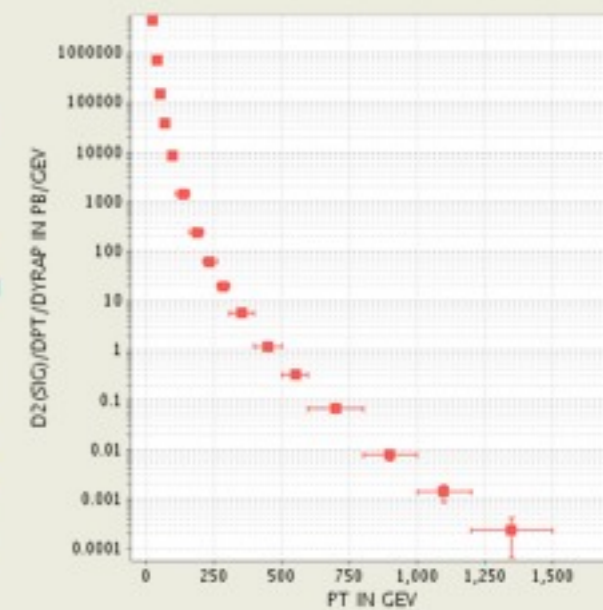
ABS(YRAP) : 0.0-0.3	
R : 0.4	
RE : P P → JET X	
SQRT(S) : 7000.0 GeV	
PT IN GEV	D2(SIG)/DPT/DYRAP IN PB/GEV
20. – 30.	4700000 ± 0.86% (stat) +20.1%, -20.3% (sys) ± 1.3% (sys)
30. – 45.	717000 ± 1.33% (stat) +17.0%, -16.3% (sys) ± 1.1% (sys)
45. – 60.	148000 ± 3.03% (stat) +12.8%, -11.5% (sys) ± 1.1% (sys)
60. – 80.	38100 ± 1.1% (stat) +10.4%, -10.1% (sys) ± 1.0% (sys)
80. – 110.	8520 ± 0.68% (stat) +10.5%, -11.5% (sys) ± 1.1% (sys)
110. – 160.	1480 ± 0.62% (stat) +9.9%, -9.3% (sys) ± 1.1% (sys)

Output formats:

- ➔ html
- ➔ plain text
- ➔ AIDA - for RIVET
- ➔ PyRoot
- ➔ YODA
- ➔ mpl
- ➔ jhepwork
- ➔ plot (simple & advanced)

## Reaction Database Single Dataset Plot

First Author: AAD11  
 Published as: Not Published  
 Preprinted as: [ARXIV:1112.6297](#)



## Reaction Database Composite Plot (Advanced)

This page displays the combined data plot with options to 'Replot' the data changing various features of the plot.

Data plot: 1  
 AAD 11 - ARXIV:1112.6297  
 CERN-LHC-ATLAS/ATLAS  
 Location: T 5, F 9  
 RE : P P → JET X  
 ABS(YRAP) : 0.3 - 0.8 num  
 R : 0.4 num  
 D2(SIG)/DPT/DYRAP IN PB/GEV ↔ PT IN GEV

Data plot: 2  
 AAD 11 - ARXIV:1112.6297  
 CERN-LHC-ATLAS/ATLAS  
 Location: T 11, F 9  
 RE : P P → JET X  
 ABS(YRAP) : 3.6 - 4.4 num  
 R : 0.4 num  
 D2(SIG)/DPT/DYRAP IN PB/GEV ↔ PT IN GEV

# SUSY/Exotics 'non-standard' record types

At the beginning of 2011 we were asked (by the ATLAS SUSY group) if HepData could handle data sets other than the standard (2-D) 'cross section' type data.

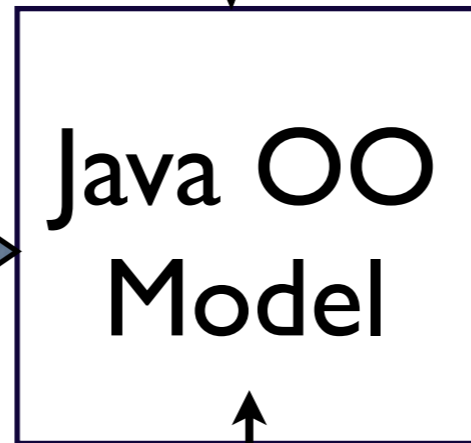
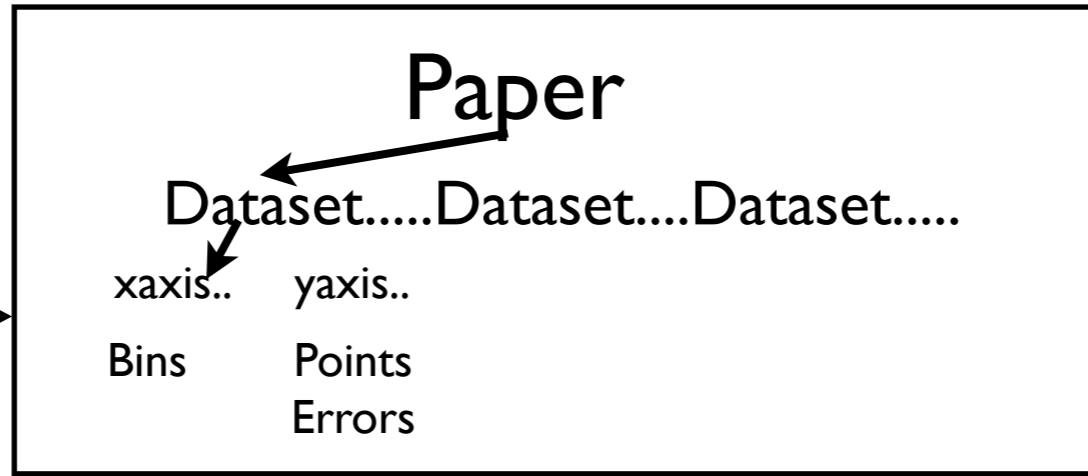
Things like:

- SLHA files

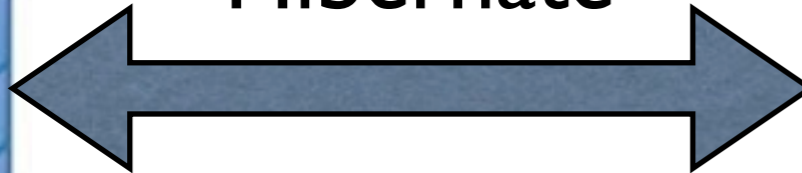
- Tables of Acceptances & Efficiencies

- 3-D tables of signal cross sections

We agreed to do this by creating a 'resource' area on the main HepData server which was linked to the specific HepData main record.



**Hibernate**



**Tapestry**



Aida    etc.....  
(Rivet)

linked using InspireId to record

Resource Area



SLHA  
Acc.  
Eff.  
etc..

Addition of 'resource' file system  
on HepData server - linked into  
the specific data record

# Beyond the standard record type

## Searches for New Physics: Les Houches Recommendations for the Presentation of LHC Results

arXiv:1203.2489  
EPJ C72(2012)1976

S. Kraml<sup>1</sup>, B.C. Allanach<sup>2</sup>, M. Mangano<sup>3</sup>, H.B. Prosper<sup>4</sup>, S. Sekmen<sup>3,4</sup> (editors),  
C. Balazs<sup>5</sup>, A. Barr<sup>6</sup>, P. Bechtle<sup>7</sup>, G. Belanger<sup>8</sup>, A. Belyaev<sup>9,10</sup>, K. Benslama<sup>11</sup>,  
M. Campanelli<sup>12</sup>, K. Cranmer<sup>13</sup>, A. De Roeck<sup>3</sup>, M.J. Dolan<sup>14</sup>, T. Eifert<sup>15</sup>, J.R. Ellis<sup>16,3</sup>,  
M. Felcini<sup>17</sup>, B. Fuks<sup>18</sup>, D. Guadagnoli<sup>8,19</sup>, J.F. Gunion<sup>20</sup>, S. Heinemeyer<sup>17</sup>,  
J. Hewett<sup>15</sup>, A. Ismail<sup>15</sup>, M. Kadastik<sup>21</sup>, M. Krämer<sup>22</sup>, J. Lykken<sup>23</sup>, F. Mahmoudi<sup>3,24</sup>,  
S.P. Martin<sup>25,26,27</sup>, T. Rizzo<sup>15</sup>, T. Robens<sup>28</sup>, M. Tytgat<sup>29</sup>, A. Weiler<sup>30</sup>

**Recommendation 1a:** *Provide a clear, explicit description of the analysis in publications. In particular, the most crucial information such as basic object definitions and event selection should be clearly displayed in the publications, preferably in tabular form, and kinematic variables utilised should be unambiguously defined. Further information necessary to reproduce the analysis should be provided, as soon as it becomes available for release, on a suitable common platform.*

We note that it is already common practice in the LHC experiments to provide useful auxiliary information for the longer papers<sup>3</sup>, e.g., in Rivet [29], on HEPdata [30] and/or collaboration twiki pages [1,2]. The inSPIRE [31] project may help to build a coherent information system, with detailed searchable and citeable entries. The ultimate goal

**Recommendation 1b:** *The community should identify, develop and adopt a common platform to store analysis databases, collecting object definitions, cuts, and all other information, including well-encapsulated functions, necessary to reproduce or use the results of the analyses, and as required by other recommendations.*

As mentioned, Rivet and HEPdata provide examples of such a platform, possibly supported by the inSPIRE indexing and searching infrastructure. Their functionality could be adapted to accommodate further needs, emerging from the discussions on the implementation of Recommendation 1b. The continued development of such tools should

**Recommendation 2a:** *Provide histograms or functional forms of efficiency maps wherever possible in the auxiliary information, along with precise definitions of the efficiencies, and preferably provide them in standard electronic forms that can easily be interfaced with simulation or analysis software.*

These standard electronic forms could rely on a platform similar to that discussed in Recommendation 1b, for example Rivet/HEPdata data and routines.

# AAD 2012 — Hunt for new phenomena using large jet multiplicities and missing transverse momentum with ATLAS in 4.7 fb<sup>-1</sup> of sqrt(s) = 7 TeV proton-proton collisions

Experiment: [CERN-LHC-ATLAS \(ATLAS\)](#)  
 Published in [JHEP 1207,167 \(DOI:10.1007/JHEP07\(2012\)167\)](#)  
 Preprinted as [CERN-PH-EP-2012-141](#)  
 Archived as: [ARXIV:1206.1760](#)  
 Record in: [INSPIRE](#)

CERN-LHC. Study of final states from proton-proton interactions at a centre-of-mass energy of 7 TeV having  $\geq 6$  jets in association with missing transverse momentum and no isolated electrons or muons. The data sample, collected in 2011, has a total integrated luminosity of 4.7 pb<sup>-1</sup>. The results are interpreted in the context of a MSUGRA/CMSSM and also a simplified model containing only a gluino octet and a neutralino. Distributions of Missing-ET/sqrt(HT), the scalar sum of the transverse momentum of the jets, are given here for 6 signal regions from minimum 6 to 9 minimum PT > 55 and 80 GeV. Tables of acceptances, efficiencies, errors and CLs value for each signal region in the context of SUSY models are also provided in the link below.

[Link to the files of: acceptances, efficiencies, errors and CLs values](#)

[View list of currently selected plots](#)

The following extra information is available for the paper:

## Acceptances, efficiencies, errors and CLs values

mSUGRA interpretation	gluino→ttbar+chi0 interpretation
6j80 signal region 7j55 signal region 7j80 signal region 8j55 signal region 8j80 signal region 9j55 signal region	6j80 signal region 7j55 signal region 7j80 signal region 8j55 signal region 8j80 signal region 9j55 signal region

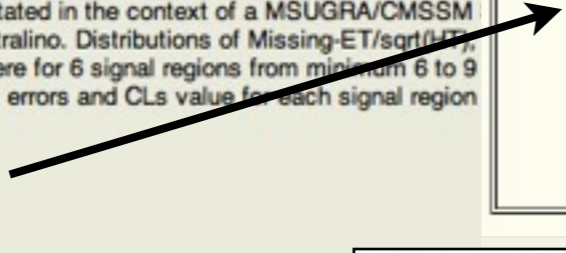


Table 1 ( F 5a. ) [hide data](#) or as: [plain text](#), [AIDA](#), [PyROOT](#), [YODA](#), [ROOT](#), [mpi](#) or [jhepwork](#). Distribution of the variable ETmiss/sqrt(HT) for events with  $\geq 7$  jets each having transverse momentum  $\geq 55$  GeV. The table gives the number of observed data events, the expected standard model background prediction and the expected SUSY signal process.

ABS(ETARAP(C=JET)) : < 2.8			
PT(C=JET) : > 55 GeV			
RE : P P --> .GE.7JET MM X			
SQRT(S) : 7000.0 GeV			
signal region : 7j55			
	DATA	SM BACKGROUND	SUSY SIGNAL
ET(C=MISSING)/SQRT(HT) IN GEV**0.5	EVENTS/2 GEV**0.5		
0.0 - 0.25	13256	13196	1.806
0.25 - 0.5	37312	36595	8.803
0.5 - 0.75	52008	50840	16.49
0.75 - 1.0	52008	50840	16.49
1.0 - 1.25	19	18.19	28.99
1.25 - 1.5	7	7.613	14.21
1.5 - 1.75	3	1.755	6.397
1.75 - 2.0	1	0.4701	2.710
2.0 - 2.25	0.0	0.07597	0.6844

```

** 7j80 Signal Region **
** Note: The following numbers are at detector level. No unfolding for detector resolution has taken place. **
***** They correspond to an integrated luminosity of 4.7/fb. *****
.....
**
m0    m12    CLs_exp    CLs_obs    NSig        Acc (%)    Acc x Eff (%)    Exp Unc (%)    MCStat Unc (%)    Th_Unc (%)
.....
260    180    0.064      0.082      47.0        0.053      0.053           34.0           39.0              8.2
260    210    0.0021     0.0028     74.0        0.089      0.18            13.0           28.0              9.1
260    240    0.24       0.25       35.0        0.099      0.16            62.0           31.0              15.0
260    270    0.0031     0.0083     43.0        0.31       0.39            37.0           19.0              9.0
260    300    0.012      0.031      31.0        0.28       0.52            32.0           17.0              10.0
260    330    0.0016     0.0073     36.0        0.75       1.1             22.0           12.0              11.0
260    360    0.058      0.18       15.0        0.6         0.7            32.0           15.0              14.0
260    390    0.018      0.11       16.0        1.1         1.4            23.0           12.0              16.0
260    420    0.039      0.21       12.0        1.4         1.5            18.0           10.0              16.0
260    450    0.19       0.53       6.6         1.2         1.4            27.0           11.0              16.0
260    510    0.46       0.83       3.1         1.9         1.9            21.0           10.0              19.0
260    540    0.6         0.9        2.1         1.9         2.1            15.0           10.0              20.0
340    180    0.0064     0.015      170.0       0.18       0.25            27.0           18.0              8.2
340    210    0.11       0.1         76.0        0.19       0.24            52.0           23.0              10.0
340    240    0.13       0.14       45.0        0.24       0.26            54.0           22.0              9.2
340    270    0.0029     0.01       42.0        0.34       0.44            26.0           18.0              11.0
340    300    0.023      0.039      39.0        0.56       0.8             33.0           14.0              13.0
340    330    0.0014     0.01       29.0        0.8         1.1            23.0           12.0              11.0
340    360    0.0048     0.037      22.0        1.1         1.2            32.0           11.0              13.0
340    390    0.024      0.16       13.0        1.2         1.4            23.0           11.0              14.0
340    420    0.09       0.38       9.0         1.5         1.5            31.0           11.0              15.0
340    450    0.12       0.46       7.7         1.8         2.1            22.0           9.3               16.0
340    480    0.23       0.61       5.6         2.1         2.5            24.0           8.7               17.0
340    510    0.46       0.83       3.1         2.3         2.2            20.0           9.5               19.0
340    540    0.49       0.84       2.8         2.8         3.2            17.0           8.3               21.0
420    180    0.042      0.035      160.0       0.25       0.32            37.0           15.0              7.0
420    210    0.0026     0.006      130.0       0.45       0.53            30.0           14.0              8.0
420    240    <0.0001    0.0002     94.0        0.64       0.7             22.0           13.0              8.7
420    270    0.021      0.024      69.0        0.89       0.94            35.0           12.0              11.0
420    300    0.018      0.034      34.0        0.47       0.87            34.0           13.0              10.0
420    330    0.0035     0.016      29.0        1.0         1.3            27.0           11.0              13.0
420    360    0.001      0.019      23.0        1.5         1.6            28.0           9.7               13.0
420    420    0.03       0.2         12.0        1.9         2.4            20.0           8.7               16.0
420    450    0.15       0.48       7.2         1.9         2.4            25.0           9.4               18.0
420    480    0.29       0.69       4.7         2.0         2.3            22.0           8.8               18.0
420    510    0.35       0.74       4.0         2.7         3.4            17.0           8.3               21.0
420    540    0.52       0.86       2.6         3.0         3.5            18.0           8.8               21.0
.....
    
```



# AAD 2011 – Search for supersymmetry using final states with one lepton, jets, and missing transverse momentum with the ATLAS detector in $\sqrt{s} = 7$ TeV pp

Experiment: [CERN-LHC-ATLAS \(ATLAS\)](#)  
 Published in [PRL 106,131802](#)  
 Preprinted as [CERN-PH-EP-2011-013](#)  
 Archived as: [ARXIV:1102.2357](#)  
 Record in: [INSPIRE](#)

CERN-LHC. Search for SUSY in final states containing one isolated lepton (electron or muon), jets and missing transverse momentum in proton-proton collisions at a centre-of-mass energy of 7 TeV. The data sample, collected during 2010, has a total integrated luminosity of 35 pb<sup>-1</sup>. No excess above the standard model is found. This record contains the distributions in missing ET, the transverse mass (MT) between the lepton and the missing transverse momentum vector, and the effective mass defined as the scalar sum of the the three leading jets, the pT of the lepton and the missing ET. Also tabulated are the 95 PCT exclusion limits on m<sub>0</sub> and m<sub>(1/2)</sub> for the MSUGRA/CMSSM model.

[Link to the tables of MSUGRA/CMSSM SLHA parameters](#)  
[Link to the combined 0 and 1 lepton analysis](#)

[View list of currently selected plots](#)

## Table 1

as: plain text, AIDA, PyROOT, YODA, ROOT, mpl or jhepwork

Distribution of ET(C=MISSING) IN GEV for data and background MC calculation  
 Location: F 1

## ATLAS MSSM\_sqgl Spring 2011 shla data files

MSSM_sqgl	g-mass															
s-mass	0050	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1200	1400	1600	1800	2000
0050	y	y	y	y	y	y	y	y	y	y						
0100	y	y	y	y	y	y	y	y	y	y						
0200	y	y	y	y	y	y	y	y	y	y						
0300	y	y	y	y	y	y	y	y	y	y						
0400	y	y	y	y	y	y	y	y	y	y						
0500	y	y	y	y	y	y	y	y	y	y						
0600	y	y	y	y	y	y	y	y	y	y						
0700	y	y	y	y	y	y	y	y	y	y						
0800	y	y	y	y	y	y	y	y	y	y						
0900	y	y	y	y	y	y	y	y	y	y						
1000	y	y	y	y	y	y	y	y	y	y						
1200		y	y	y	y	y	y									
1400	y	y	y	y	y	y	y									
1600		y	y	y	y	y	y									
1800		y	y	y	y	y	y									
2000	y	y	y	y	y	y	y									

```
# ISAJET SUSY parameters in SUSY Les Houches Accord 2 format
# Created by ISALSA 2.0 Last revision: C. Balazs 21 Apr 2009
Block SPINFO # Program information
1 ISASUGRA from ISAJET # Spectrum Calculator
2 7.80 29-OCT-2009 12:50:36 # Version number
Block MODESEL # Model selection
1 13 # Non-universal supergravity model
Block SHINPPTS # Standard Model inputs
1 1.27836243E+02 # alpha_em^(-1)
2 1.16570000E-05 # G_Fermi
3 1.17200002E-01 # alpha_s(M_Z)
4 9.11699992E+01 # m_c(M_Z)
5 4.19999991E+00 # m_b(M_Z)
6 1.72500000E+02 # m_top(pole)
7 1.77699999E+00 # m_tau(pole)
Block MINPAR # SUSY breaking input parameters
0 5.00000000E+03 # m_0
1 5.00000000E+03 # m_1/2
2 1.04999999E+00 # tan(beta)
3 1.00000000E+00 # sign(tau)
4 0.00000000E+00 # A_0
5 0.00000000E+00 # M_1/2
Block EXTPAR # Non-universal SUSY breaking parameters
0 1.00000000E+00 # Left scale
21 -1.21530960E+07 # Down type Higgs mass squared
22 -1.21524730E+07 # Up type Higgs mass squared
1 0.00000000E+00 # U(1)_Y gaugino (Bino) mass
2 5.00000000E+03 # SU(2)_L gaugino (Wino) mass
3 5.00000000E+02 # SU(3)_C gaugino (gluino) mass
34 5.00000000E+03 # Right scalar electron mass
31 5.00000000E+03 # Left 1st gen. slepton mass
47 5.00000000E+02 # Right scalar down mass
44 5.00000000E+02 # Right scalar up mass
41 5.00000000E+02 # Left 1st gen. squark mass
36 5.00000000E+03 # Right scalar tau mass
33 5.00000000E+03 # Left 3rd gen. slepton mass
49 5.00000000E+03 # Right scalar bottom mass
46 5.00000000E+03 # Right scalar top mass
43 5.00000000E+03 # Left 3rd gen. squark mass
Block MASS # Scalar and gaugino mass spectrum
# PGC code mass particle
24 8.04229965E+01 # W+
25 5.00000000E+03 # h^0
35 5.00000000E+03 # H^0
36 5.00000000E+03 # A^0
```

SLHA file

efficiency\*acceptance information: [sqgl\\_0lgrid\\_HEPdata.txt](#)  
 gzipped tar file of all data files: [MSSM\\_sqgl.tar.gz](#)  
 uuencoded version of above: [MSSM\\_sqgl.uu](#)

: DATA		: BACKGROUND	
ABS(ETARAP(C=ELECTRON)) : < 2.47 - (1.37 TO 1.52)			
ABS(ETARAP(C=JET)) : < 2.50			
ABS(ETARAP(C=MUON)) : < 2.40			
PT(C=JET) : > 30 GeV			
PT(C=LEADING JET) : > 60 GeV			
PT(C=LEPTON) : > 20 GeV			
RE : P P --> LEPTON .GE.3JETS MM			
SQRT(S) : 7000.0 GeV			
ET(C=MISSING) IN GEV	N		
0. - 10.	332 +19.1,-18.1 (stat)	238 ± 63.2 (stat)	+39.9,-36.3 (sys)
10. - 20.	730 +27.9,-26.9 (stat)	712.9 ± 146.0 (stat)	+156.2,-0.0 (sys)
20. - 30.	716.0 +27.6,-26.6 (stat)	878.7 ± 166.3 (stat)	+0.0,-201.7 (sys)
30. - 40.	635.0 +26.1,-25.1 (stat)	604.9 ± 116.1 (stat)	+95.8,-25.5 (sys)

ngl	maq	Expected # signal events (A,B,C,D)	Acceptance * efficiency (A,B,C,D)	Excluded (A,B,C,D)
100	100	1.07e+03,0.00e+00,1.40e+03,0.00e+00	6.26e-04,0.00e+00,8.25e-04,0.00e+00	y,n,n,n
100	200	2.78e+02,0.00e+00,4.62e+02,0.00e+00	2.98e-04,0.00e+00,4.96e-04,0.00e+00	n,n,y,n
100	300	2.74e+02,0.00e+00,5.23e+02,0.00e+00	3.42e-04,0.00e+00,6.53e-04,0.00e+00	n,n,y,n
100	400	3.13e+02,7.89e+01,7.05e+02,0.00e+00	4.11e-04,1.04e-04,9.26e-04,0.00e+00	n,n,n,n
100	500	2.01e+02,0.00e+00,2.38e+02,0.00e+00	2.49e-04,0.00e+00,3.18e-04,0.00e+00	n,n,n,n
100	600	9.30e+01,0.00e+00,3.34e+02,0.00e+00	1.25e-04,0.00e+00,4.55e-04,0.00e+00	n,n,y,n
100	700	2.24e+02,0.00e+00,3.00e+02,0.00e+00	3.04e-04,0.00e+00,4.04e-04,0.00e+00	n,n,n,n
100	800	3.39e+02,0.00e+00,4.13e+02,0.00e+00	4.40e-04,0.00e+00,5.59e-04,0.00e+00	n,n,y,n
100	1000	7.16e+01,0.00e+00,1.11e+02,0.00e+00	1.00e-04,0.00e+00,3.05e-04,0.00e+00	n,n,n,n
100	1400	0.00e+00,0.00e+00,1.47e+02,0.00e+00	0.00e+00,0.00e+00,2.05e-04,0.00e+00	n,n,n,n
100	2000	7.36e+01,0.00e+00,2.94e+02,0.00e+00	1.00e-04,0.00e+00,4.05e-04,0.00e+00	n,n,n,n
200	100	1.21e+03,3.03e+01,1.53e+03,0.00e+00	3.77e-03,9.45e-05,4.77e-03,0.00e+00	y,n,n,n
200	200	1.71e+03,7.42e+01,2.01e+03,2.18e+01	2.41e-02,1.13e-03,3.06e-02,3.32e-04	y,y,n,n
200	300	5.08e+02,2.50e+01,1.02e+03,1.09e+01	1.38e-02,6.80e-04,2.77e-02,2.96e-04	y,y,y,n
200	400	4.35e+02,3.41e+01,9.31e+02,1.01e+01	1.56e-02,1.22e-03,3.33e-02,3.61e-04	y,n,y,n
200	500	4.44e+02,2.62e+01,7.75e+02,0.00e+00	1.81e-02,1.07e-03,3.16e-02,0.00e+00	y,n,y,n
200	600	3.54e+02,2.25e+01,6.09e+02,4.62e+00	1.54e-02,9.77e-04,2.64e-02,2.01e-04	y,y,y,n
200	700	2.41e+02,3.16e+01,4.95e+02,1.43e+01	1.08e-02,1.42e-03,2.22e-02,6.40e-04	y,y,y,n
200	800	2.20e+02,2.42e+01,4.30e+02,8.05e+00	1.00e-02,1.19e-03,1.96e-02,3.47e-04	y,y,y,n
200	900	1.87e+02,1.71e+01,3.76e+02,1.27e+01	8.59e-03,7.85e-04,1.73e-02,5.83e-04	y,n,y,n
200	1000	1.73e+02,1.13e+01,3.72e+02,7.42e+00	7.98e-03,5.21e-04,1.72e-02,3.42e-04	y,n,y,n
200	1400	1.51e+02,1.00e+01,3.33e+02,6.48e+00	6.99e-03,5.00e-04,1.54e-02,3.00e-04	y,n,y,n
200	2000	1.62e+02,8.66e+00,3.59e+02,0.00e+00	7.49e-03,4.00e-04,1.66e-02,0.00e+00	n,n,y,n
300	100	9.94e+02,5.56e+01,1.41e+03,3.73e+01	5.28e-03,2.95e-04,7.49e-03,1.97e-04	y,n,n,n
300	200	1.35e+03,7.74e+01,1.82e+03,2.49e+01	6.30e-03,3.42e-03,8.55e-03,1.26e-03	y,n,y,y
300	300	1.60e+03,9.04e+01,1.49e+03,4.64e+01	1.99e-01,1.12e-02,1.85e-01,5.77e-03	y,y,n,y
300	400	4.86e+02,3.94e+01,8.35e+02,1.13e+01	1.05e-01,8.48e-03,1.85e-01,2.43e-03	y,y,y,n
300	500	3.49e+02,3.58e+01,5.83e+02,1.12e+01	1.05e-01,1.08e-02,1.75e-01,3.37e-03	y,y,y,y
300	600	3.13e+02,2.59e+01,4.87e+02,1.14e+01	1.15e-01,9.49e-03,1.78e-01,4.18e-03	y,y,y,y
300	700	2.32e+02,2.42e+01,3.94e+02,1.03e+01	9.49e-02,9.90e-03,1.61e-01,4.21e-03	y,y,y,y
300	800	2.01e+02,2.03e+01,3.41e+02,1.09e+01	8.74e-02,8.83e-03,1.48e-01,4.74e-03	y,y,y,y
300	900	1.84e+02,1.87e+01,3.21e+02,1.23e+01	8.31e-02,8.44e-03,1.45e-01,5.55e-03	y,y,y,y
300	1000	1.46e+02,1.38e+01,3.11e+02,9.44e+00	7.45e-02,6.36e-03,1.43e-01,4.35e-03	y,n,y,y
300	1400	1.61e+02,1.30e+01,2.93e+02,3.86e+00	7.57e-02,6.11e-03,1.38e-01,1.81e-03	y,n,y,n
300	2000	1.54e+02,9.47e+00,2.96e+02,3.25e+00	7.21e-02,4.53e-03,1.39e-01,1.52e-03	y,n,y,n
400	100	8.25e+02,6.35e+01,9.87e+02,3.21e+01	5.43e-03,4.31e-04,6.59e-03,2.11e-04	y,n,y,n

Expected # signal events Acceptance \* efficiency

# Contents of HepData

7882 records (=papers)

191 LHC ATLAS:95

CMS: 47

ALICE: 34

LHCB: 11

TOTEM: 3

LHCf: 1

ATLAS:

38/57 STD

39/44 SUSY

10/56 EXOT

5/7 HION

1/28 TOPQ

1/8 BPHYS

CMS:

25/63 STD

1/32 SUSY

2/65 EXOT

5/20 HION

1/21 TOPQ

13/17 BPHYS

# HepData - finding the record

HepData has basic search facilities

- EXP, RE, OBS, FSP, REF etc...

+ Inspire type searches (eg. title:xxx)

+ individual records linked from Inspire....

Welcome to INSPIRE! INSPIRE is out of beta and ready to replace SPIRES. SPIRES will be switched off soon. If you have questions, comments or concerns, please email us at [feedback@inspirehep.net](mailto:feedback@inspirehep.net).

HEP :: HEPNAMES :: INSTITUTIONS :: CONFERENCES :: JOBS :: HELP :: SPIRES :: Exp

recid 1082936 Brief format Search Easy Search Advanced Search

find | "Phys.Rev.Lett.,105" :: more

Sort by: latest first desc. - or rank by -

Display results: 25 results single list

HEP 1 records found Search took 0.15 seconds.

1. Measurement of inclusive jet and dijet production in pp collisions at  $\sqrt{s}$  = 7 TeV using the ATLAS detector. ATLAS Collaboration (Georges Aad (Freiburg U.) et al.). arXiv:1112.6297, CERN-PH-EP-2011-192. Dec 2011. 41 pp. e-Print: arXiv:1112.6297 [hep-ex]

[References](#) | [BibTeX](#) | [LaTeX\(US\)](#) | [LaTeX\(EU\)](#) | [Harvmac](#) | [EndNote](#)  
[Abstract and Postscript](#) and [PDF](#) from arXiv.org; [HepData](#)

[Detailed record](#) - [Cited by 3 records](#)

+ eg.. ATLAS publications pages....

the W → lν and Zγ → ll production cross sections in proton-proton collisions with the ATLAS detector	Inspire record, Plots	JHEP 12 (2010) 060 (11 Oct 2010)	SM
Inclusive jet and dijet cross sections in proton-proton collisions at 7 TeV energy with the ATLAS detector	Inspire record, Plots, Data points	EPJ C 71 (2011) 1512 (30 Sep 2010)	SM
Quark Contact Interactions in Dijet Angular Distributions in 7 TeV Proton-Proton collisions with the ATLAS Detector at the LHC	Inspire record, Plots	Phys. Lett. B 694 (2011) 327-345 (26 Sep 2010)	Exotics

The Durham HepData Project

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

Reaction Database Search Result

Search: exp lhc  
 Result: 86 documents found (displaying 1 to 20) First | Previous | Next | Last | All

Enter query:  Search again

...need help with searching?

- AAD 2012 – Experiment: CERN-LHC-ATLAS (ATLAS)  
 Preprint: CERN-PH-EP-2001-218 Archive: ARXIV:1201.1276  
*Study of jets produced in association with a W boson in pp collisions at  $\sqrt{s}$  = 7 TeV with the ATLAS detector*  
[Full data record](#) | [Short data record](#) | [INSPIRE](#)
- AAD 2011 – Experiment: CERN-LHC-ATLAS (ATLAS)  
 Preprint: CERN-PH-EP-2011-192 Archive: ARXIV:1112.6297  
*Measurement of inclusive jet and dijet production in pp collisions at  $\sqrt{s}$  = 7 TeV using the ATLAS detector*  
[Full data record](#) | [Short data record](#) | [INSPIRE](#)
- AAD 2011 – Experiment: CERN-LHC-ATLAS (ATLAS)  
 Preprint: CERN-PH-EP-2011-162 Archive: ARXIV:1111.2690  
*Measurement of the production cross section for Zγ in association with jets in pp collisions at  $\sqrt{s}$  = 7 TeV with the ATLAS detector*  
[Full data record](#) | [Short data record](#) | [INSPIRE](#)
- AAD 2011 – Experiment: CERN-LHC-ATLAS (ATLAS)  
 Preprint: CERN-PH-EP-2011-154 Archive: ARXIV:1110.2693  
*Search for Massive Colored Scalars in Four-Jet Final States in  $\sqrt{s}$ =7 TeV proton-proton collisions with the ATLAS Detector*  
[Full data record](#) | [Short data record](#) | [INSPIRE](#)
- AAD 2011 – Experiment: CERN-LHC-ATLAS (ATLAS)  
 Preprint: CERN-PH-EP-2011-155 Archive: ARXIV:1110.2299  
*Search for new phenomena in final states with large jet multiplicities and missing transverse momentum using  $\sqrt{s}$ =7 TeV pp collisions with the ATLAS detector*  
[Full data record](#) | [Short data record](#) | [INSPIRE](#) | [Rivet](#)
- AAMODT 2011 – Experiment: CERN-LHC-ALICE (ALICE)  
 Archive: ARXIV:1110.0121  
*Particle-yield modification in jet-like azimuthal di-hadron correlations in Pb-Pb collisions at  $\sqrt{s_{NN}}$  = 2.76 TeV*  
[Full data record](#) | [Short data record](#) | [INSPIRE](#)
- AAD 2011 – Experiment: CERN-LHC-ATLAS (ATLAS)  
 Published: EPJ C 71,1846 Preprint: CERN-PH-EP-2011-146 Archive: ARXIV:1109.6833  
*Measurement of the inclusive and dijet cross-sections of b-jets in pp collisions at  $\sqrt{s}$  = 7 TeV with the ATLAS detector*  
[Full data record](#) | [Short data record](#) | [INSPIRE](#)
- AAD 2011 – Experiment: CERN-LHC-ATLAS (ATLAS)

note the link to Rivet

+ working with Elsevier to place banner flag on their web page when paper has HepData record.

# Inspire & HepData

There are Inspire $\Leftrightarrow$ HepData links in the records  
Plus, now: ( thanks to Piotr Praczyk - Inspire Group)

- \* HepData data within and displayable in Inspire
- \* Inspire search terms in HepData (eg keyword:supersymmetry)

The screenshot shows the Inspire website interface. At the top, there is a navigation bar with links for HEP, HEP NAMES, INSTITUTIONS, CONFERENCES, JOBS, EXPERIMENTS, and HELP. Below this, there are tabs for Information, References (21), Citations (25), Files, Plots, and HEP Data. The main content area displays the title "Measurement of the Inclusive Isolated Prompt Photon Cross Section in p anti-p Collisions at s\*\*(1/2) = 1.96-TeV using the CDF Detector." by the CDF Collaboration. It includes the publication date (Oct 2009), page count (8 pp.), and various identifiers like Phys.Rev. D80 (2009) 111106, DOI, and arXiv preprint link. An abstract is provided at the bottom.

This screenshot shows the same record on the HepData website. It includes the title and authors, followed by a note: "This data comes from the Durham HEPData project". Below this, there is a "SUMMARY:" section and a "Comments:" section. A "Table" section is visible, containing a data table with columns for  $ET_3$  (GeV) and  $d(\sigma)/dET_3/dETARAP_3$  (fb/GeV). The table is partially obscured by a "Plot" window showing a plot of  $ETARAP_3 \in (-1.0, 1.0)$  for  $\bar{p}p \rightarrow \text{GAMMA} X$  at  $\sqrt{s} = 1960.0$  GeV. The table content is as follows:

$ET_3$ (GeV)	$d(\sigma)/dET_3/dETARAP_3$ (fb/GeV)
!!!Expand!!!	

# Inspire & HepData

This data comes from the Durham HEPData project

SUMMARY:

Comments:

Table

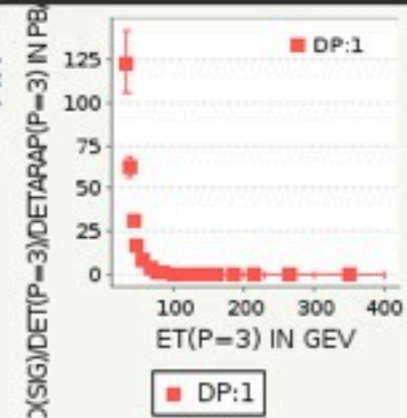
[Plain](#)

$$ETARAP_3 \in (-1.0, 1.0)$$

$$\bar{p}p \rightarrow GAMMA X$$

$$\sqrt{s} = 1960.0 \text{ GeV}$$

↑↑↑epiH↑↑↑



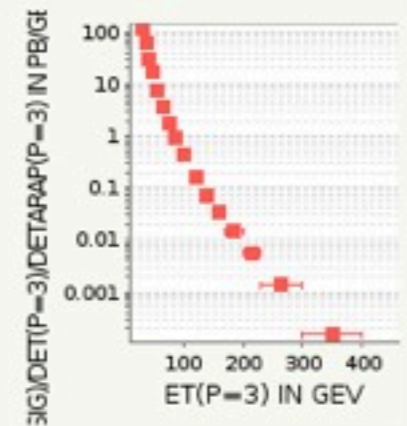
$ET_3 \text{ (GeV)}$

$d(\sigma)/dET_3/dETARAP_3 \text{ (Pb/GeV)}$

↑↑Collapse↑↑

$ET_3 \text{ (GeV)}$	$d(\sigma)/dET_3/dETARAP_3 \text{ (Pb/GeV)}$
30.0 – 34.0	$123 \pm 1 \text{ (stat)} +15.5\%, -14.5\% \text{ (sys)}$
34.0 – 39.0	$62.1 \pm 0.3 \text{ (stat)} +10.8\%, -9.8\% \text{ (sys)}$
39.0 – 44.0	$31.0 \pm 0.2 \text{ (stat)} +9.8\%, -8.4\% \text{ (sys)}$
44.0 – 50.0	$17.2 \pm 0.2 \text{ (stat)} +10.2\%, -8.1\% \text{ (sys)}$
50.0 – 60.0	$7.93 \pm 0.08 \text{ (stat)} +10.1\%, -8.4\% \text{ (sys)}$
60.0 – 70.0	$3.54 \pm 0.05 \text{ (stat)} +9.8\%, -8.5\% \text{ (sys)}$
70.0 – 80.0	$1.76 \pm 0.03 \text{ (stat)} +10.0\%, -9.1\% \text{ (sys)}$
80.0 – 90.0	$0.908 \pm 0.014 \text{ (stat)} +9.3\%, -7.9\% \text{ (sys)}$
90.0 – 110.0	$0.441 \pm 0.005 \text{ (stat)} +8.8\%, -8.7\% \text{ (sys)}$
110.0 – 130.0	$0.168 \pm 0.003 \text{ (stat)} +8.6\%, -8.7\% \text{ (sys)}$
130.0 – 150.0	$0.0725 \pm 0.0016 \text{ (stat)} +7.8\%, -8.0\% \text{ (sys)}$
150.0 – 170.0	$0.0341 \pm 0.0008 \text{ (stat)} +8.8\%, -10.0\% \text{ (sys)}$
170.0 – 200.0	$0.0146 \pm 0.0004 \text{ (stat)} +8.8\%, -9.1\% \text{ (sys)}$
200.0 – 230.0	$0.00566 \pm 0.00024 \text{ (stat)} +9.0\%, -10.6\% \text{ (sys)}$
230.0 – 300.0	$0.00138 \pm 0.00008 \text{ (stat)} +10.0\%, -10.7\% \text{ (sys)}$
300.0 – 400.0	$0.000149 \pm 0.000021 \text{ (stat)} +15.2\%, -13.4\% \text{ (sys)}$

ETARAP(P=3) : -1.0 TO 1.0



# HepData - entering data

At present all data entry is done at Durham by either myself or my assistant.

Data files are sent to us by the experimenters which we convert into the required input format.

Authors validate before data is transferred to the public database

Before the LHC we had to ask...but now we are getting several request/week to enter data from the LHC experimenters!

In the long term this situation needs to be changed.

Need to get external encoders or **experiments** themselves to help by **inputting direct** into data records with Durham providing an overarching management role controlling the actual entry into the public database.

# HepData - entering the data

## D.I.Y.

We have been developing a web entry form  
+ simplified entry language

The screenshot shows the 'DATA INPUT FORM' interface. At the top, there is a navigation bar with links: REACTION DATABASE, DATA REVIEWS, PARTON DISTRIBUTION FUNCTION SERVER, and OTHER HEP RESOURCES. The main form area is titled 'DATA INPUT FORM'. It contains several steps and options:

- Step 1: 'Please specify a file to upload' with a 'Choose File' button (no file selected) and an 'Upload' button.
- Step 2: 'Uploading the file 6011.input' with a 'Process' button.
- Step 3: 'the Input Data - then -[Display] the Final Record' with a 'getstarted' button and an input field for 'with arXiv:'.
- Step 4: A 'Display' button (highlighted in blue) next to the 'getstarted' button.

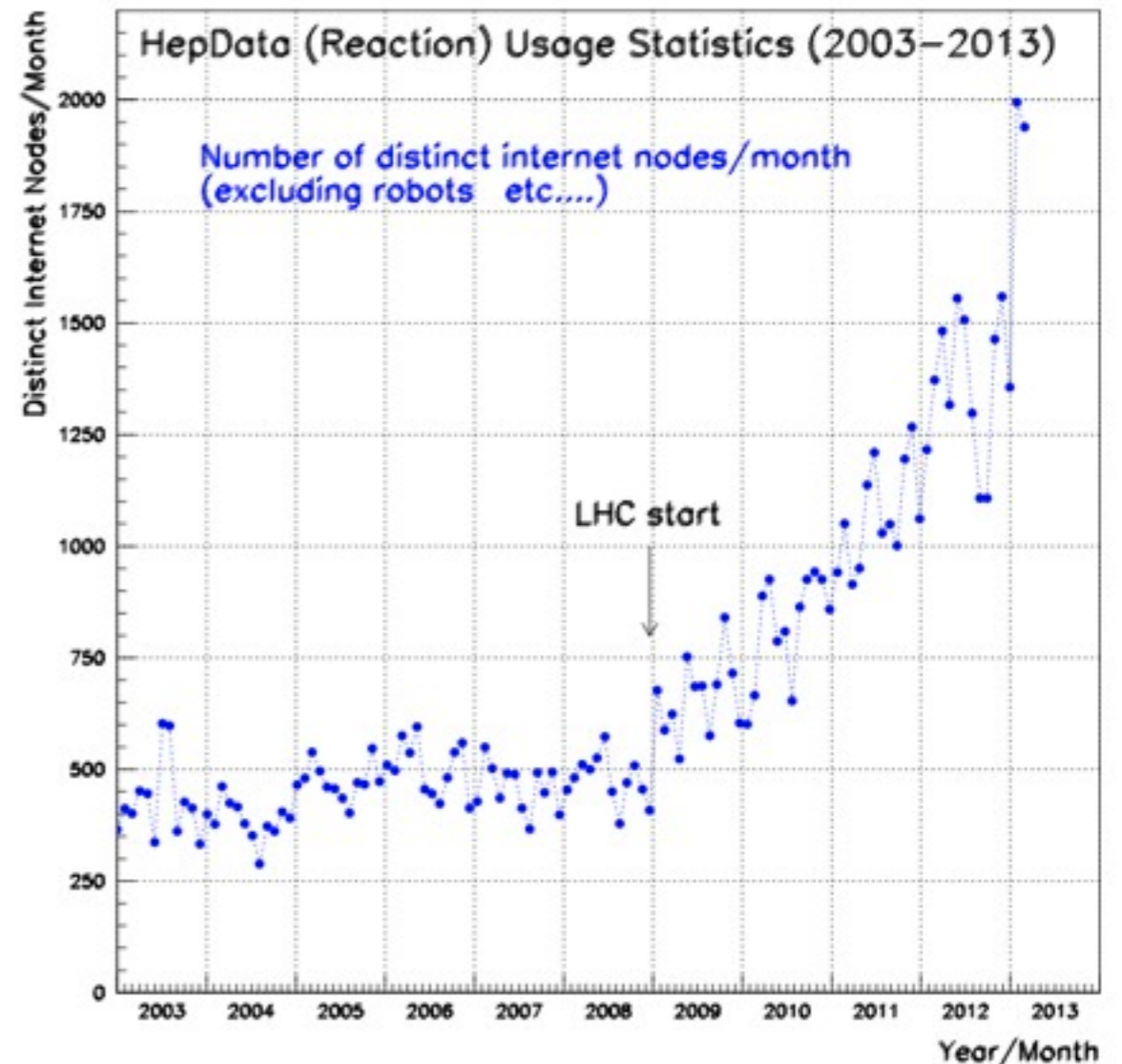
A dashed box highlights the 'getstarted' button and the 'with arXiv:' input field, with an arrow pointing to it from the text 'Extracts the 'bibliographic' metadata from arXiv to get started'. Below the form, a text area displays the following metadata:

```
*author: AAD
*reference: CERN-PH-EP-2012-197 : 2012
*reference: ARXIV:1208.2880 : 2012
*status: Encoded 17 AUG 2012 by MRW
*title: Search for new phenomena in the WW to l nu lprime nuprime final state in pp collisions at sqrt(s) = 7 TeV with the ATLAS detector
*comment: CERN-LHC
*spiresId: 8888888
*durhamId: 6011
*inspireId: 1127504
*detector: ATLAS
*experiment: CERN-LHC-ATLAS
*dataset:
*location: T 2,F 2
*dscomment: Expected and observer 95% upperlimits on cross section time branching ration for pp --> G < WW >
*reackey: P P -->
*obskey: SIG
*qual: RE : P P --> G X
*qual: SQRT(S) IN GEV : 7000
*yheader: ACCEPTANCE*EFFICIENCY : SIG(C=EXPECTED) IN PB : SIG(C=OBSERVED) IN PB
*xheader: MT(C=GRAVITON(RS)) IN GEV
*data: x : y : Y : y
200 ; 3.0 +- 0.1; 17.6; 20.3;
350 ; 16.8 +- 0.5; 4.68; 5.51;
500 ; 24.4 +- 0.7; 1.30; 1.46;
750 ; 30.7 +- 0.9; 0.315; 0.264;
```

# HepData Usage

As a metric to measure the use of HepData we have continued to count the number of **distinct internet nodes**, excluding robots etc., accessing **per month**.

This remained steady from ~500 up to 2009, the start of the LHC, then has **increased three-fold** to the present.





# HepData Summary

**Continue to compile cross sections based on publications**

>30years (3+1) years funded by STFC from Oct 2012

**2009 moved from BDMS to new maintainable computing system**

based on Java OO data model & MySQL database.

**Expanded to include 'resource' area for LHC extra 'data'**

for eg. LHC acceptances, efficiencies SLHA files

**Inspire <=> Hepdata collaboration greatly increased**

HepData 'data' in Inspire + Inspire fields searchable from HepData

**Record discovery (beyond direct keyword searching) expanded.**

URL link to/from Inspire

URL link from LHC experiments publication pages

Banner page URL link from Elsevier publications (Phys.Lett..)

**Proposed data input direct from experiments needed for future**

trial web based system being used/assessed by outside users

**Use figures increase 3-fold since 2009**

now ~1500 distinct internet nodes per month.