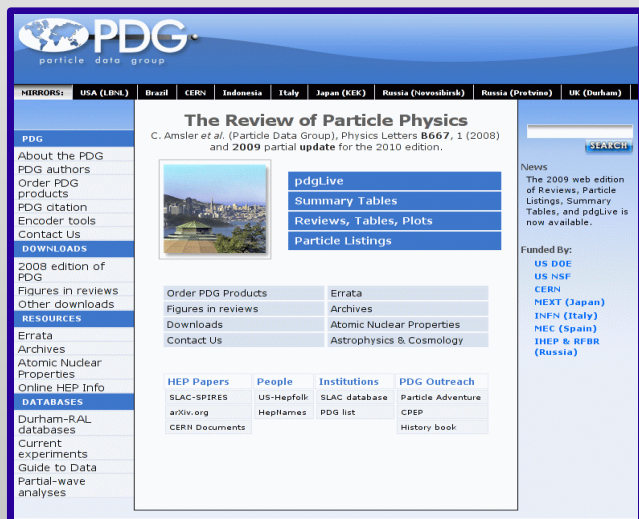


Cross-Linking with the Particle Data Group

Juerg Beringer

Particle Data Group

Lawrence Berkeley National Laboratory



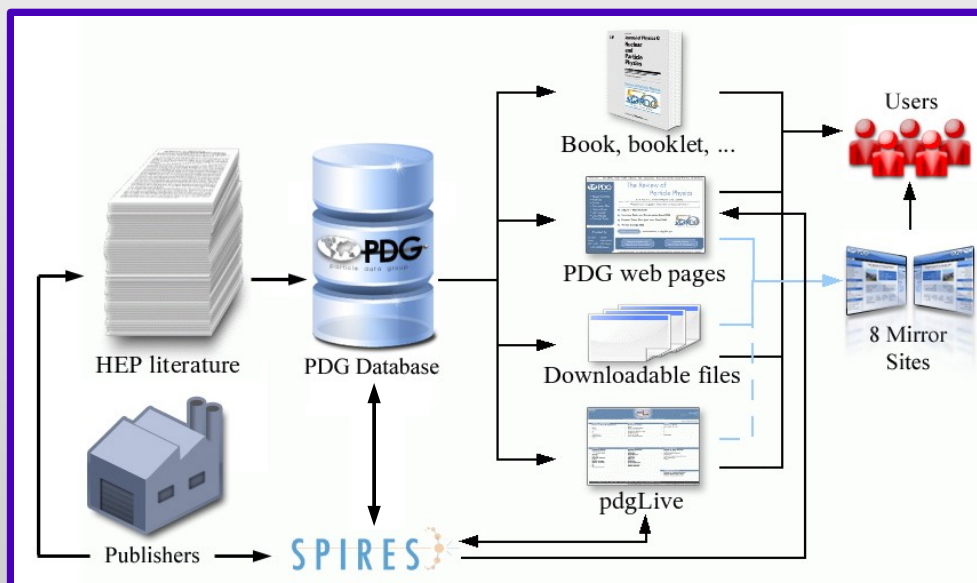
Outline:

- Introduction
- Interaction with SPIRES
- Cross-linking with PDG Identifiers
- Status of computing upgrade

- PDG is an international collaboration charged with **summarizing Particle Physics**, as well as related areas of **Cosmology and Astrophysics**
 - **170 authors** from 20 countries and 108 institutions
 - Plus 700 consultants in the particle physics community

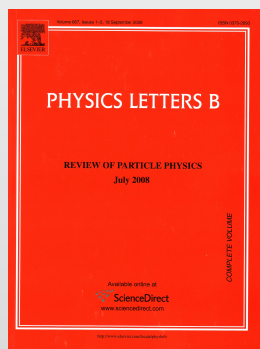


- Primary goal is to **evaluate** and **review** available published data in order to give authoritative answers endorsed by the experts in the field
 - We rely on publishers and libraries (in particular through SPIRES) for access to published data



- As part of doing its work, PDG naturally catalogs published results, but this is not our primary goal

- Our main product “Review of Particle Physics”
 - 2008 edition: 1344 pages, over 2,500 citations (SPIRES)
 - Available in print and online as <http://pdgLive.lbl.gov>



=

τ^- DECAY MODES

τ^\pm modes are charge conjugates of the modes below. $^{*0}h^0$ stands for h^0 or K^0 , $^{*0}\nu$ stands for ν or $\bar{\nu}$. “Neutral” stands for γ and $\nu\bar{\nu}$.

Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Modes with one charged particle		
Γ_1 particle $\rightarrow \geq 0$ neutrals $\geq 0K^0 \nu_\tau$ (“1-prong”)	(60.32 ± 0.09) %	S=1.4
Γ_2 particle $\rightarrow \geq 0$ neutrals $\geq 0K^0 \nu_\tau$	(17.36 ± 0.05) %	S=1.4
Γ_3 $\mu^- \bar{\nu}_\mu \nu_\tau$	[3.6 ± 0.4] × 10 ⁻³	
Γ_4 $e^- \bar{\nu}_e \nu_\tau$	[17.84 ± 0.05] %	
Γ_5 $e^+ \bar{\nu}_e \nu_\tau$	[1.75 ± 0.10] %	
Γ_6 $h^- \rightarrow 0K^0 \nu_\tau$	[12.14 ± 0.07] %	
Γ_7 $h^- \rightarrow \nu_\tau$	[11.59 ± 0.06] %	S=1.1
Γ_8 $\pi^- \nu_\tau$	[10.99 ± 0.07] %	S=1.1
Γ_9 $K^- \nu_\tau$	[6.91 ± 0.23] × 10 ⁻³	S=1.3
Γ_{10} $h^- \rightarrow \geq 1$ neutrals ν_τ	[27.05 ± 0.12] %	S=1.3
Γ_{11} $h^- \rightarrow \geq 1 \nu_\tau$ (ex. K^0)	[36.51 ± 0.12] %	S=1.3
Γ_{12} $h^- \rightarrow \geq 1 \nu_\tau$ (ex. K^0)	[28.95 ± 0.10] %	S=1.1
Γ_{13} $\pi^- \rightarrow \nu_\tau$	[28.50 ± 0.10] %	S=1.1
Γ_{14} $\pi^- \rightarrow \nu_\tau$	[3.0 ± 3.2] × 10 ⁻³	S=1.5
Γ_{15} $K^- \rightarrow \nu_\tau$	[4.52 ± 0.27] × 10 ⁻³	S=1.1
Γ_{16} $K^- \rightarrow \nu_\tau$	[0.81 ± 0.16] %	S=1.5
Γ_{17} $h^- \rightarrow 2 \nu_\tau$	[9.47 ± 0.12] %	S=1.3
Γ_{18} $h^- \rightarrow 2 \nu_\tau$ (ex. K^0)	[9.31 ± 0.12] %	S=1.3
Γ_{19} $h^- \rightarrow 2 \nu_\tau$ (ex. K^0)	[9.25 ± 0.12] %	S=1.3
Γ_{20} $\pi^- \rightarrow 2 \nu_\tau$ (ex. K^0)	< 9 × 10 ⁻³	CL=95%
Γ_{21} $\pi^- \rightarrow 2 \nu_\tau$ (ex. K^0)	< 7 × 10 ⁻³	CL=95%
Γ_{22} $\pi^- \rightarrow 2 \nu_\tau$ (ex. K^0)	< 7 × 10 ⁻³	CL=95%
Γ_{23} $K^- \rightarrow 2 \nu_\tau$ (ex. K^0)	[5.8 ± 2.3] × 10 ⁻⁴	S=1.1
Γ_{24} $h^- \rightarrow 3 \nu_\tau$	[1.35 ± 0.07] %	S=1.1
Γ_{25} $h^- \rightarrow 3 \nu_\tau$ (ex. K^0)	[1.25 ± 0.07] %	S=1.1
Γ_{26} $h^- \rightarrow 3 \nu_\tau$	[1.17 ± 0.08] %	S=1.1
Γ_{27} $\pi^- \rightarrow 3 \nu_\tau$ (ex. K^0)	[1.18 ± 0.08] %	S=1.1
Γ_{28} $K^- \rightarrow 3 \nu_\tau$ (ex. K^0)	[4.2 ± 2.1] × 10 ⁻⁴	S=1.1
Γ_{29} $h^- \rightarrow 4 \nu_\tau$ (ex. K^0)	[1.6 ± 0.4] × 10 ⁻³	S=1.1
Γ_{30} $h^- \rightarrow 4 \nu_\tau$ (ex. K^0)	[1.6 ± 0.4] × 10 ⁻³	S=1.1
Γ_{31} $K^- \rightarrow 0 \nu_\tau \geq 0K^0 \geq 0 \nu_\tau$	[1.97 ± 0.04] %	S=1.1
Γ_{32} $K^- \rightarrow \geq 1 (\pi^0 \text{ or } K^0 \text{ or } \gamma) \nu_\tau$	[8.76 ± 0.33] × 10 ⁻³	S=1.1

Listings with
Summary Tables

+

10. ELECTROWEAK MODEL AND CONSTRAINTS ON NEW PHYSICS

Revised September 2005 by J. Erler (U. Mass. Univ. of Pennsylvania).

Section	Page	Section	Page
10.1 Introduction	97	10.10 Neutrino mass, mixing, & flavor change (rev.)	156
10.2 Renormalization and radiative corrections	98	10.11 Quark model (rev.)	173
10.3 Cross-section and asymmetry formulae	100	10.12 Structure functions (rev.)	181
10.4 Precision tests of the Standard Model	101	10.13 Fragmentation functions in e^+e^- annihilation (rev.)	195
10.5 W and Z bosons	106		
		REVIEW, TABLES, AND PLOTS	
		1. Physical constants (rev.)	97
		2. Astrophysical constants (rev.)	98
		3. International System of Units (SI)	100
		4. Periodic table of the elements (rev.)	101
		5. Electronic structure of the elements (rev.)	102
		6. Atomic and nuclear properties of materials	104
		7. Electromagnetic relations (rev.)	106
		8. Naming scheme for hadrons	108
		Standard Model and Related Topics	
		9. Quantum chromodynamics (rev.)	110
		10. Electroweak model and constraints on new physics (rev.)	119
		11. The Cabibbo-Kobayashi-Maskawa quark-mixing matrix (new)	138
		12. CP violation (rev.)	146
		13. Neutrino Mass, Mixing, & Flavor Change (rev.)	156
		14. Quark model (rev.)	165
		15. Grand Unified Theories (rev.)	173
		16. Structure functions (rev.)	181
		17. Fragmentation functions in e^+e^- annihilation (rev.)	195
		Astrophysics and cosmology	
		18. Experimental tests of gravitational theory (rev.)	205
		19. Big-Bang cosmology (rev.)	210
		20. Big-Bang nucleosynthesis (rev.)	220
		21. The cosmological parameters (rev.)	224
		22. Dark matter (rev.)	233
		23. Cosmic microwave background (rev.)	238
		24. Cosmic rays (rev.)	245
		Experimental Methods and Colliders	
		25. Accelerator physics of colliders (rev.)	252

108 Review Articles

- A large amount of data that one might want to reference online from different systems

So far have interacted with SPIRES in two ways:

- **Harvesting of information based on paper reference**
 - Authors and titles
 - Used e.g. to display paper titles in popup windows in pdgLive

VALUE (GeV)	DOCUMENT ID	TECN	COMMENT
171.2 ± 2.1	OUR EVALUATION See comments in the header above.		
170.8 ± 2.2 ± 1.4	1, 2	AALTONEN	071 CDF lepton + jets (b-tag)
176.2 ± 9.2 ± 3.9	3	ABAZOV	AALTONEN 2007I : Physical Review Letters 99 (2007) 182002
179.5 ± 7.4 ± 5.6	3	ABAZOV	Precise Measurement of the Top-Quark Mass in the Lepton+Jets Topology at CDF II
164.5 ± 3.9 ± 3.9	4, 2	ABULENCIA	07J CDF lepton + jets
180.7 ± 15.5 ± 8.6	5	ABULENCIA	07J CDF lepton + jets

- **Cross-referencing between SPIRES/INSPIRE and PDG**
 - From pdgLive to SPIRES, and from SPIRES/INSPIRE to pdgLive
 - From internal PDG pages for encoders to SPIRES (as a convenient way to point encoders to relevant papers)
 - Based on “**CODEN, Volume, Page**” where possible, on **SLAC IRN** otherwise (how should this be done with INSPIRE?)

- From pdgLive to SPIRES



HOME: [pdgLive](#) | [Summary Tables](#) | [Reviews, Tables, Plots](#) | [Particle Listings](#)

from the 2008 Review of Particle Physics.
Please use this **CITATION**: C. Amsler *et al.* (Particle Data Group), Phys. Lett.

t-Quark Mass in $p\bar{p}$ Collisions

OUR EVALUATION of $171.2 \pm 1.2 \pm 1.8$ GeV (TEVEWWG 2008A) is an average from Tevatron Run-I (1992 – 1996) and Run-II (2001–present) that were included in this Review. This average was provided by the Tevatron Electroweak Working Group, which correlated uncertainties properly into account and has a χ^2 of 10.6 for 10 degrees of freedom. The most recent unpublished top mass measurements from Run-II, the TEVEWWG of $172.6 \pm 0.8 \pm 1.1$ GeV (TEVEWWG 2008). See the note “The Top Quark”.

For earlier search limits see PDG 1996, Physical Review D54 (1996) 1. We note that indirect top mass determinations from Standard Model Electroweak fits in the literature can be found in the Listings of the 2007 partial update). For a discussion of current “The Top Quark” and “Electroweak Model and Constraints on New Physics.”

VALUE (GeV)	DOCUMENT ID	TECN	COMMENT
171.2 ± 2.1	OUR EVALUATION		See comments in the h
$170.8 \pm 2.2 \pm 1.4$	1, 2 AALTONEN 07I CDF		lepton
$176.2 \pm 9.2 \pm 3.9$	3 ABAZOV 07W D0		dilepton
$179.5 \pm 7.4 \pm 5.6$	3 ABAZOV 07W D0		dilepton
$164.5 \pm 3.9 \pm 3.9$	4, 2 ABULENCIA 07D CDF		dilepton
$180.7 \pm 13.5 \pm 8.6$	5 ABULENCIA 07J CDF		lepton + jets
$170.3 \pm 4.1 \pm 1.2$	6, 2 ABAZOV 06U D0		lepton + jets (b tag)



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Precision measurement of the top quark mass from dilepton events at CDF II.
By CDF - Run II Collaboration (A. Abulencia *et al.*). FERMILAB-PUB-06-490-E, Dec 2006. 7pp.
Published in **Phys.Rev.D75:031105,2007**.
e-Print: [hep-ex/0612060](#)

[References](#) | [LaTeX\(US\)](#) | [LaTeX\(EU\)](#) | [Harvmac](#) | [BibTeX](#) | [Keywords](#) | Cited 22 times
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Journal Server [doi:[10.1103/PhysRevD.75.031105](#)]
[Fermilab Library Server](#) (fulltext available)
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[pdgLive](#) (measurements quoted by PDG)
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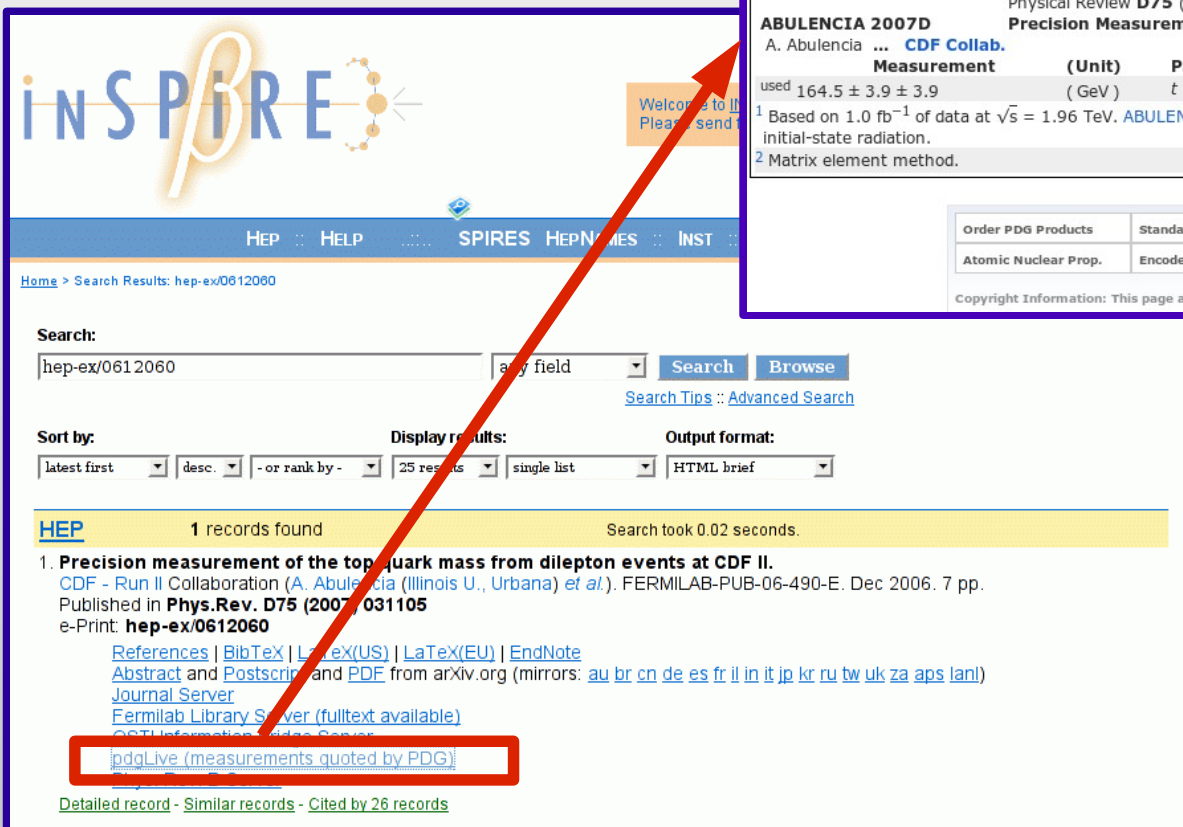
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[spires@slac.stanford.edu](#)

List of RPP sections, measurements, reviews for reference PR D75 031105R. (ABULENCIA 2007D)

Physical Review D75 (2007) 031105R		ABULENCIA 2007D Precision Measurement of the Top-Quark Mass from Dilepton Events	
A. Abulencia ... CDF Collab.			
Measurement	(Unit)	Particle (Section)	Observable
used 164.5 \pm 3.9 \pm 3.9	(GeV)	t	t-Quark Mass in $p\bar{p}$ Collisions
¹ Based on 1.0 fb ⁻¹ of data at \sqrt{s} = 1.96 TeV. ABULENCIA 2007D improves the matrix element description including the effects of initial-state radiation.			
² Matrix element method.			

- From INSPIRE to pdgLive
 - Only if paper is included in Listings



INSPIRE

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Home > Search Results: hep-ex/0612060

Search:

hep-ex/0612060 any field Search Browse

Search Tips :: Advanced Search

Sort by: latest first desc. - or rank by - Display results: 25 results single list Output format: HTML brief

HEP 1 records found Search took 0.02 seconds.

1. Precision measurement of the top quark mass from dilepton events at CDF II.
 CDF - Run II Collaboration (A. Abulencia (Illinois U., Urbana) *et al.*). FERMILAB-PUB-06-490-E. Dec 2006. 7 pp.
 Published in **Phys.Rev. D75 (2007) 031105**
 e-Print: [hep-ex/0612060](#)
[References](#) | [BibTeX](#) | [LaTeX\(US\)](#) | [LaTeX\(EU\)](#) | [EndNote](#)
[Abstract](#) and [Postscript](#) and [PDF](#) from arXiv.org (mirrors: [au](#) [br](#) [cn](#) [de](#) [es](#) [fr](#) [il](#) [in](#) [it](#) [jp](#) [kr](#) [ru](#) [tw](#) [uk](#) [za](#) [aps](#) [lanl](#))
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PDG Live

particle data group

HOME: pdgLive Summary Tables Reviews, Tables, Plots Particle Listings

from the 2008 Review of Particle Physics.
 Please use this CITATION: C. Amsler *et al.* (Particle Data Group), Phys. Lett. **B667**, 1 (2008)

ABULENCIA 2007D (PHRVA,D75,031105R)

Physical Review **D75** (2007) 031105R
Precision Measurement of the Top-Quark Mass from Dilepton Events at CDF II

A. Abulencia ... **CDF Collab.**

Measurement	(Unit)	Particle (Section)	Observable
used 164.5 ± 3.9 ± 3.9	(GeV)	t	t-Quark Mass in p p-bar Collisions

1 Based on 1.0 fb⁻¹ of data at $\sqrt{s} = 1.96$ TeV. ABULENCIA 2007D improves the matrix element description by including the effects of initial-state radiation.
 2 Matrix element method.

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Atomic Nuclear Prop.	Encoder tools	Errata	PDG Archives	PDG citation	

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- **Current one-to-one linking between SPIRES/INSPIRES and PDG very useful but limited**
- **Wish list:**
 - A user looking at an entry in INSPIRE:
“What data does PDG have about this?”
 - Entries in the Listings for related particles or particle properties
 - PDG review articles on related topics
 - A user looking at an entry in PDG:
“What are the latest preprints / publications on this topic?”
 - ...
- **Discussions started at 3rd HEP Information Resource Summit on how to do this**
 - Since then worked together with Annette Holtkamp, Kirsten Sachs and others on this topic

Behind the scene, the PDG Listings define a well-established classification scheme for particle physics data:

LIGHT UNFLAVORED MESONS ($S = C = B = 0$)			
For $I = 1$ (π, b, ρ, a): $u\bar{d}, (u\bar{u}-d\bar{d})/\sqrt{2}, d\bar{u}$; for $I = 0$ ($\eta, \eta', h, h', \omega, \phi, f, f'$): $c_1(u\bar{u} + d\bar{d}) + c_2(s\bar{s})$			
π^\pm	$I^G(J^P) = 1^-(0^-)$		
Mass $m = 139.57018 \pm 0.00035$ MeV ($S = 1.2$)			
Mean life $\tau = (2.6033 \pm 0.0005) \times 10^{-8}$ s ($S = 1.2$)			
$c\tau = 7.8045$ m			
$\pi^\pm \rightarrow \ell^\pm \nu \gamma$ form factors [a]			
$F_V = 0.017 \pm 0.008$			
$F_A = 0.0115 \pm 0.0005$ ($S = 1.2$)			
$R = 0.059^{+0.009}_{-0.008}$			
π^- modes are charge conjugates of the modes below.			
For decay limits to particles which are not established, see the appropriate Search sections (Massive Neutrino Peak Search Test, A^0 (axion), and Other Light Boson (X^0) Searches, etc.).			
π^+ DECAY MODES	Fraction (Γ_i/Γ)	Confidence level	P (MeV/c)
$\mu^+ \nu_\mu$	[b] $(99.98770 \pm 0.00004) \%$		30
$\mu^+ \nu_\mu \gamma$	[c] $(2.00 \pm 0.25) \times 10^{-4}$		30
$e^+ \nu_e$	[b] $(1.230 \pm 0.004) \times 10^{-4}$		70

Code

Description

S008

π^\pm (particle code)

S008M

π^\pm mass

S008T

π^\pm life time

S008CTA

$\pi^\pm c\tau$

S008FV

π^\pm form factor F_V

S008, 1

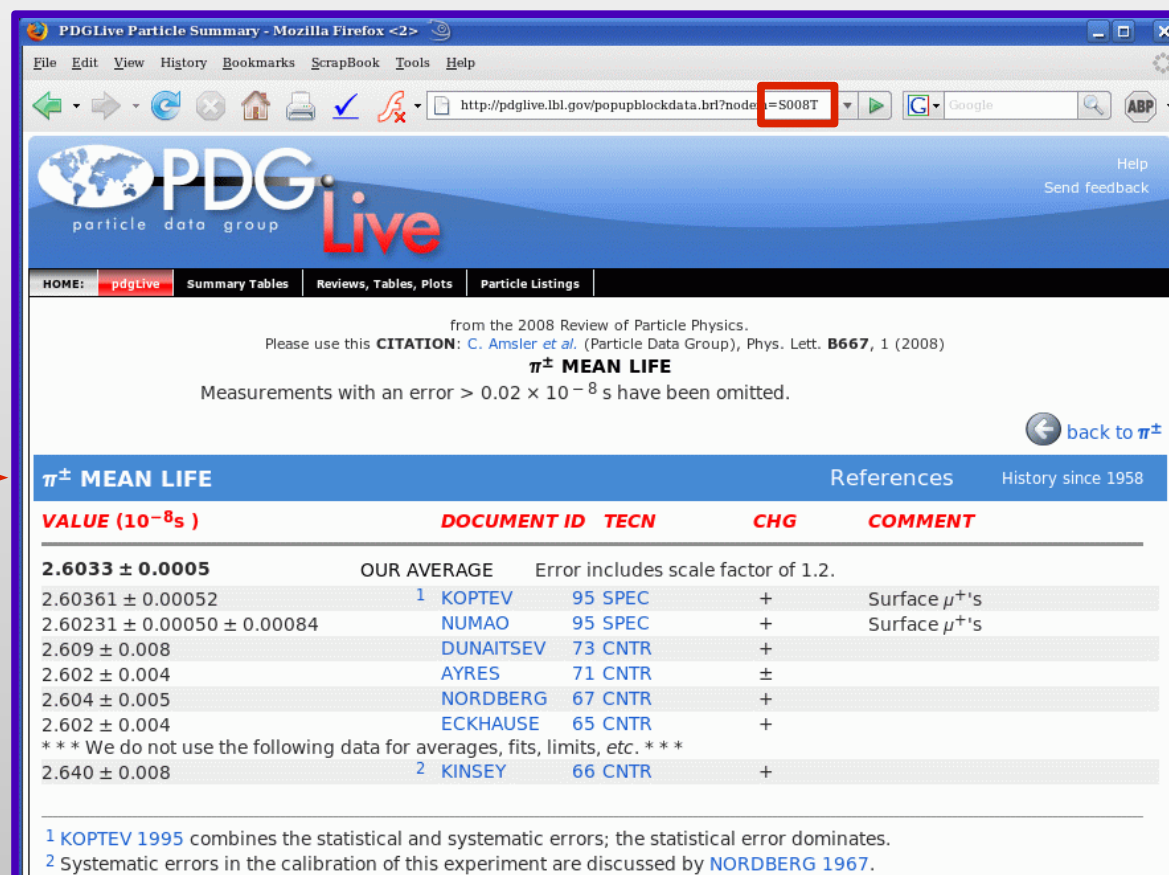
π^\pm decay mode: $\mu^+ \nu_\mu$

S008, 2

π^\pm decay mode: $e^+ \nu_e$

- The classification code is a unique string that leads directly to the corresponding PDG data
 - Similarly for PDG reviews

S008T →



PDGLive Particle Summary - Mozilla Firefox <2>

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http://pdglive.lbl.gov/popublockdata.brl?node=S008T

PDG Live

Help Send feedback

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from the 2008 Review of Particle Physics.
Please use this CITATION: C. Amsler *et al.* (Particle Data Group), Phys. Lett. **B667**, 1 (2008)

π[±] MEAN LIFE

Measurements with an error > 0.02 × 10⁻⁸ s have been omitted.

[back to π[±]](#)

VALUE (10 ⁻⁸ s)	DOCUMENT ID	TECN	CHG	COMMENT
2.6033 ± 0.0005	OUR AVERAGE	Error includes scale factor of 1.2.		
2.60361 ± 0.00052	¹ KOPTEV	95 SPEC	+	Surface μ ⁺ 's
2.60231 ± 0.00050 ± 0.00084	NUMAO	95 SPEC	+	Surface μ ⁺ 's
2.609 ± 0.008	DUNAITSEV	73 CNTR	+	
2.602 ± 0.004	AYRES	71 CNTR	±	
2.604 ± 0.005	NORDBERG	67 CNTR	+	
2.602 ± 0.004	ECKHAUSE	65 CNTR	+	
*** We do not use the following data for averages, fits, limits, etc. ***				
2.640 ± 0.008	² KINSEY	66 CNTR	+	

¹ KOPTEV 1995 combines the statistical and systematic errors; the statistical error dominates.
² Systematic errors in the calibration of this experiment are discussed by NORDBERG 1967.

- **Formalized this classification into externally usable PDG Identifiers**

- Strings w/o spaces of the form

`[DATABASE::]NODE[:ATTRIBUTE=VALUE[,ATTRIBUTE=VALUE...]]`

where

- DATABASE: PDG database/RPP edition (optional)
- **NODE: a PDG node (e.g. S008)**
- ATTRIBUTE, VALUE: additional qualifiers (e.g. decay modes)

- **Examples:**

- S008 pi+-
- S008M pi+- mass (MeV)
- S008T pi+- mean life time (10**-8 s)
- S008:Desig=1 pi+ --> mu+ nu_mu

- **PDG will provide up-to-date authoritative list**
 - Once defined, meaning of an identifier will not change
 - Preliminary list contains ~8,000 identifiers
- **Can be used to link to PDG information (e.g. in pdgLive)**
- **New version of pdgLive will allow lookup of PDG Identifiers and using PDG Identifiers as references**
- **NB: There are PDG Identifiers for decay modes like**

$$\eta \rightarrow 2\gamma \quad S014:Desig=1$$

$$\eta \rightarrow \pi^0 2\gamma \quad S014:Desig=7$$

but not for branching ratios like

$$\frac{\Gamma(\eta \rightarrow \pi^0 2\gamma)}{\Gamma(\eta \rightarrow 2\gamma)}$$

- **Work on a translation table between PDG Identifiers and HEP Taxonomy (Annette Holtkamp et al)**

- Further discussions during this summit ...

- **Examples:**

```
[PDGitem]
PDGcode = S044W
Description = Z WIDTH (GeV)
Query = "Z0: width"
```

```
[PDGitem]
PDGcode = S044:Desig=1
Description = Z --> e+ e-
Query = "Z0 --> positron electron"
```

```
[PDGitem]
PDGcode = S044Z0T
Description = A*(0,tau)(FB) CHARGE ASYMMETRY IN e+ e- --> tau+ tau-
Query = "electron positron: annihilation" and "tau: pair production"
or "electron positron --> tau+ tau-" and
("charge: asymmetry" or "angular distribution: asymmetry")
```




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Home > Search Results: "z0: width" and experimental results

Search: "z0: width" and experimental results any field Search Browse

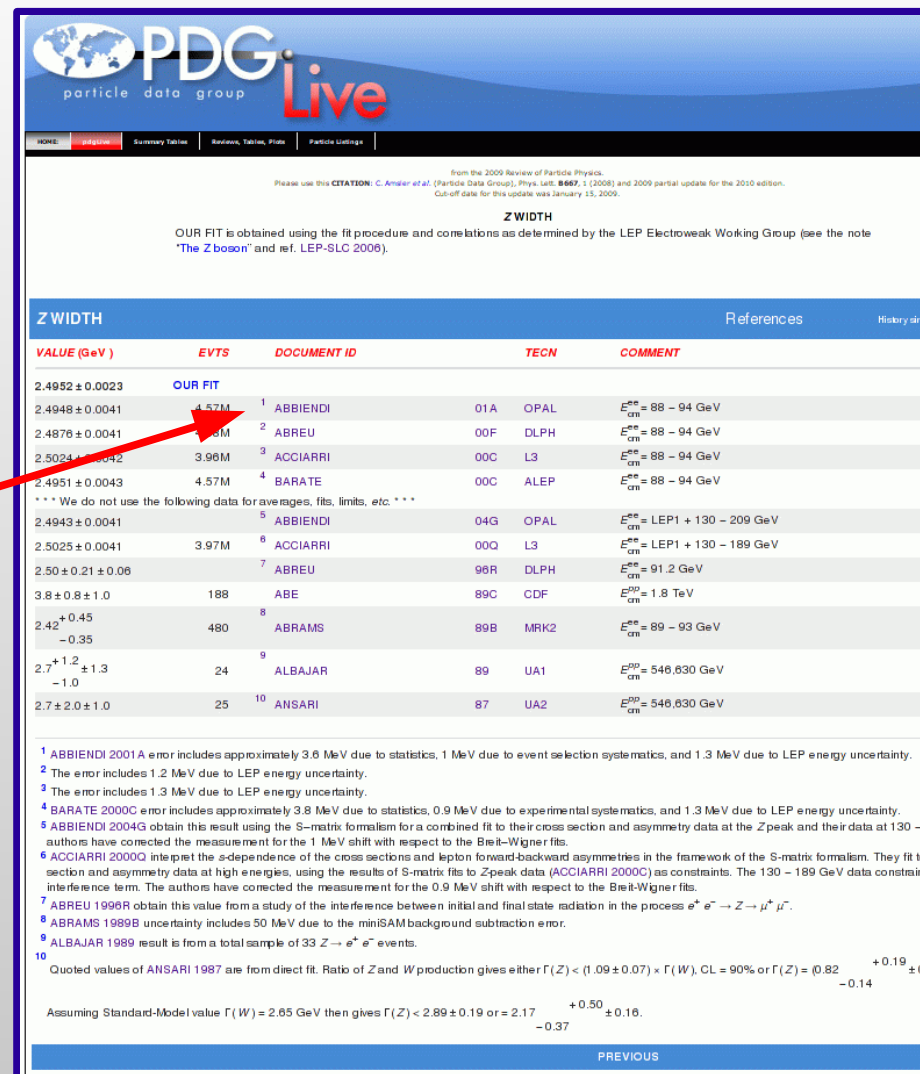
Sort by: latest first desc times cited Display results: 25 results single list Output format: HTML brief

HEP 586 records found 71 - 95 jump to record: 71 Search took 0.02 seconds.

71. **Precise determination of the Z resonance parameters at LEP: 'Zedometry'.**
 (37) OPAL Collaboration (G. Abbiendi *et al.*). CERN-EP-2000-148, OPAL-PR-328. Nov 2000. 120 pp.
 Published in *Eur.Phys.J. C19* (2001) 587-651
 e-Print: [hep-ex/0012018](#)
[References](#) | [BibTeX](#) | [LaTeX\(US\)](#) | [LaTeX\(EU\)](#) | [EndNote](#)
[Abstract](#) and [Postscript](#) and PDF from arXiv.org (mirrors: [au](#) [br](#) [cn](#) [de](#) [es](#) [fr](#) [it](#) [jp](#) [kr](#) [ru](#) [tw](#) [uk](#) [za](#) [aps](#) [lanl](#))
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[Reaction Data \(Durham\)](#)
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72. **A Direct measurement of the Z0 invisible width by single photon counting.**
 (37) OPAL Collaboration (M.Z. Akrawy *et al.*). CERN-PPE-90-187. Dec 1990. 25 pp.
 Published in *Z.Phys. C50* (1991) 373-384
 Prepared for [SPIRES Conference C91/03/03](#) (Moriond 1991:Electroweak:53-60)
[References](#) | [BibTeX](#) | [LaTeX\(US\)](#) | [LaTeX\(EU\)](#) | [EndNote](#)
[Journal Server](#)
[CERN Library Record](#)
[Reaction Data \(Durham\)](#)
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73. **A Precision measurement of the number of neutrino species.**
 (36) L3 Collaboration (B. Adeva *et al.*). L3-009, Jul 1990. 25 pp.
 Published in *Phys.Lett. B249* (1990) 341-352
[References](#) | [BibTeX](#) | [LaTeX\(US\)](#) | [LaTeX\(EU\)](#) | [EndNote](#)
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particle data group

from the 2009 Review of Particle Physics
 Please use this CITATION: C. Amundson *et al.* (Particle Data Group), *Phys. Lett. B* **687**, 1 (2008) and 2009 partial update for the 2010 edition.
 Cut-off date for this update was January 15, 2009.

OUR FIT is obtained using the fit procedure and correlations as determined by the LEP Electroweak Working Group (see the note "The Z boson" and ref. LEP-SLC 2006).

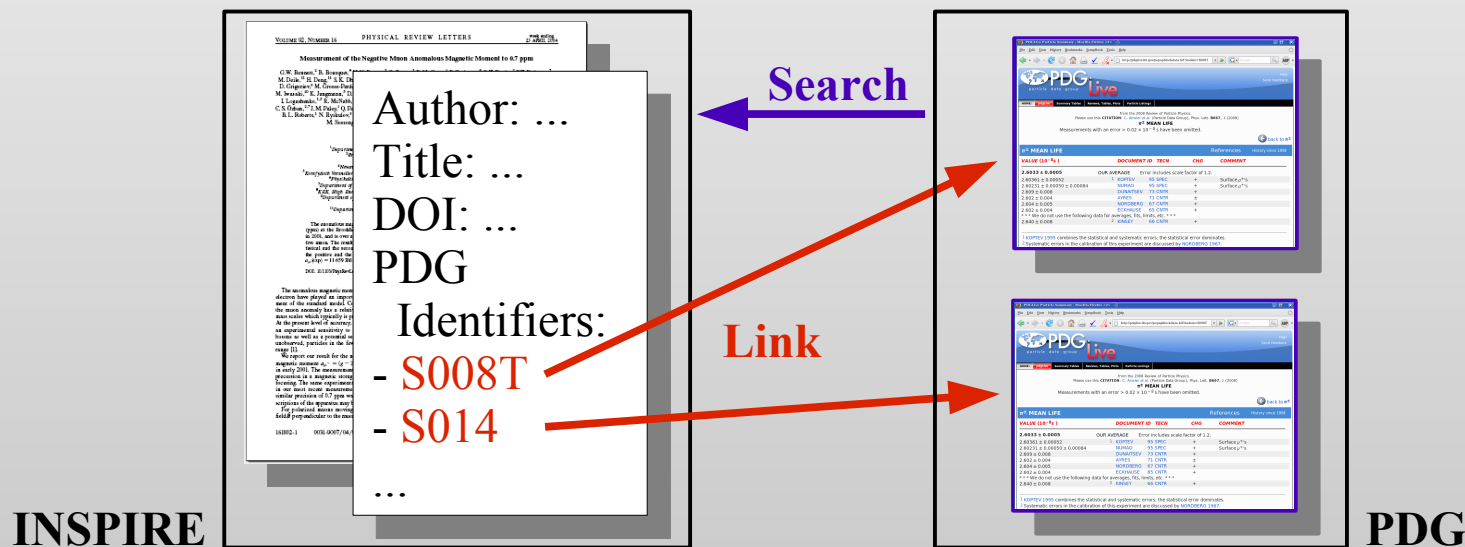
Z WIDTH

VALUE (GeV)	EVTS	DOCUMENT ID	TECN	COMMENT
2.4952 ± 0.0023	OUR FIT			
2.4948 ± 0.0041	4.57M	1 ABBIENDI	01A	OPAL $E_{cm}^{ee} = 88 - 94$ GeV
2.4876 ± 0.0041	4.57M	2 ABREU	00F	DLPH $E_{cm}^{ee} = 88 - 94$ GeV
2.5024 ± 0.0042	3.96M	3 ACCIARRI	00C	L3 $E_{cm}^{ee} = 88 - 94$ GeV
2.4951 ± 0.0043	4.57M	4 BARATE	00C	ALEP $E_{cm}^{ee} = 88 - 94$ GeV
*** We do not use the following data for averages, fits, limits, etc. ***				
2.4943 ± 0.0041		5 ABBIENDI	04G	OPAL $E_{cm}^{ee} = \text{LEP1} + 130 - 209$ GeV
2.5025 ± 0.0041	3.97M	6 ACCIARRI	00Q	L3 $E_{cm}^{ee} = \text{LEP1} + 130 - 189$ GeV
2.50 ± 0.21 ± 0.06		7 ABREU	96R	DLPH $E_{cm}^{ee} = 91.2$ GeV
3.8 ± 0.8 ± 1.0	188	8 ABE	89C	CDF $E_{cm}^{pp} = 1.8$ TeV
2.42 ^{+0.45} _{-0.35}	480	9 ABRAMS	89B	MRK2 $E_{cm}^{ee} = 89 - 93$ GeV
2.7 ^{+1.2} _{-1.0}	24	10 ALBAJAR	89	UA1 $E_{cm}^{pp} = 546,630$ GeV
2.7 ± 2.0 ± 1.0	25	10 ANSARI	87	UA2 $E_{cm}^{pp} = 546,630$ GeV

1 ABBIENDI 2001A error includes approximately 3.6 MeV due to statistics, 1 MeV due to event selection systematics, and 1.3 MeV due to LEP energy uncertainty.
 2 The error includes 1.2 MeV due to LEP energy uncertainty.
 3 The error includes 1.3 MeV due to LEP energy uncertainty.
 4 BARATE 2000C error includes approximately 3.8 MeV due to statistics, 0.9 MeV due to experimental systematics, and 1.3 MeV due to LEP energy uncertainty.
 5 ABBIENDI 2004G obtain this result using the S-matrix formalism for a combined fit to their cross section and asymmetry data at the Z peak and their data at 130 - authors have corrected the measurement for the 1 MeV shift with respect to the Breit-Wigner fits.
 6 ACCIARRI 2000Q interpret the s-dependence of the cross sections and lepton forward-backward asymmetries in the framework of the S-matrix formalism. They fit to section and asymmetry data at high energies, using the results of S-matrix fits to Zpeak data (ACCIARRI 2000C) as constraints. The 130 - 189 GeV data constrain interference term. The authors have corrected the measurement for the 0.9 MeV shift with respect to the Breit-Wigner fits.
 7 ABREU 1996R obtain this value from a study of the interference between initial and final state radiation in the process $e^+e^- \rightarrow Z \rightarrow \mu^+\mu^-$.
 8 ABRAMS 1989B uncertainty includes 50 MeV due to the miniSAM background subtraction error.
 9 ALBAJAR 1989 result is from a total sample of 33 Z $\rightarrow e^+e^-$ events.
 10 Quoted values of ANSARI 1987 are from direct fit. Ratio of Z and W production gives either $\Gamma(Z) < (1.09 \pm 0.07) \times \Gamma(W)$, CL = 90% or $\Gamma(Z) = (0.82 \pm 0.19 \pm 0.14)$
 Assuming Standard-Model value $\Gamma(W) = 2.65$ GeV then gives $\Gamma(Z) < 2.89 \pm 0.19$ or $\pm 2.17 \pm 0.50 \pm 0.16$
 -0.37

PREVIOUS

- Include PDG Identifiers as tags into article metadata?
 - Lets INSPIRE point directly to relevant sections of PDG
 - Can generate initial set of tags from PDG database
 - Could allow authors to tag their articles using a convenient GUI (similar to pdgLive) to find the relevant identifier



- How do you enter or search for example for

$$B^+ \rightarrow \overline{D}^*(2007)^0 \ell^+ \nu_\ell$$

- **Same problem for web-based tools where PDG collaborators will enter data into PDG database**
 - Cannot expect occasional user to know correct PDG internal representation: `#d{ B+ --> Dbar^(2007)0 lepton+ nu_lepton }`
- **Tried different approaches – current solution:**
 - User assembles desired expression by dragging into place the desired items from (hierarchical) lists of possible items
 - Example: *→ demo of prototype tool to define new branching ratios to be included into Review of Particle Physics*
- **Perhaps something similar might work well for searches for decay modes in INSPIRE?**

- **Aim at a much more comprehensive cross-linking of PDG and INSPIRE (and any others interested)**
- **The PDG Computing Upgrade that is in progress will include support for this from the PDG side**
 - Expect (internal) deployment of the backbone of the new system this summer (updated database schema, Java and Python APIs, test application of major data entry tool)
 - Within about a year a new pdgLive with cross-linking support should be available
- **Continue collaboration started long ago with SLAC with INSPIRE on cross-linking and information interchange**

Additional Slides

2,778 new measurements from **645** new papers

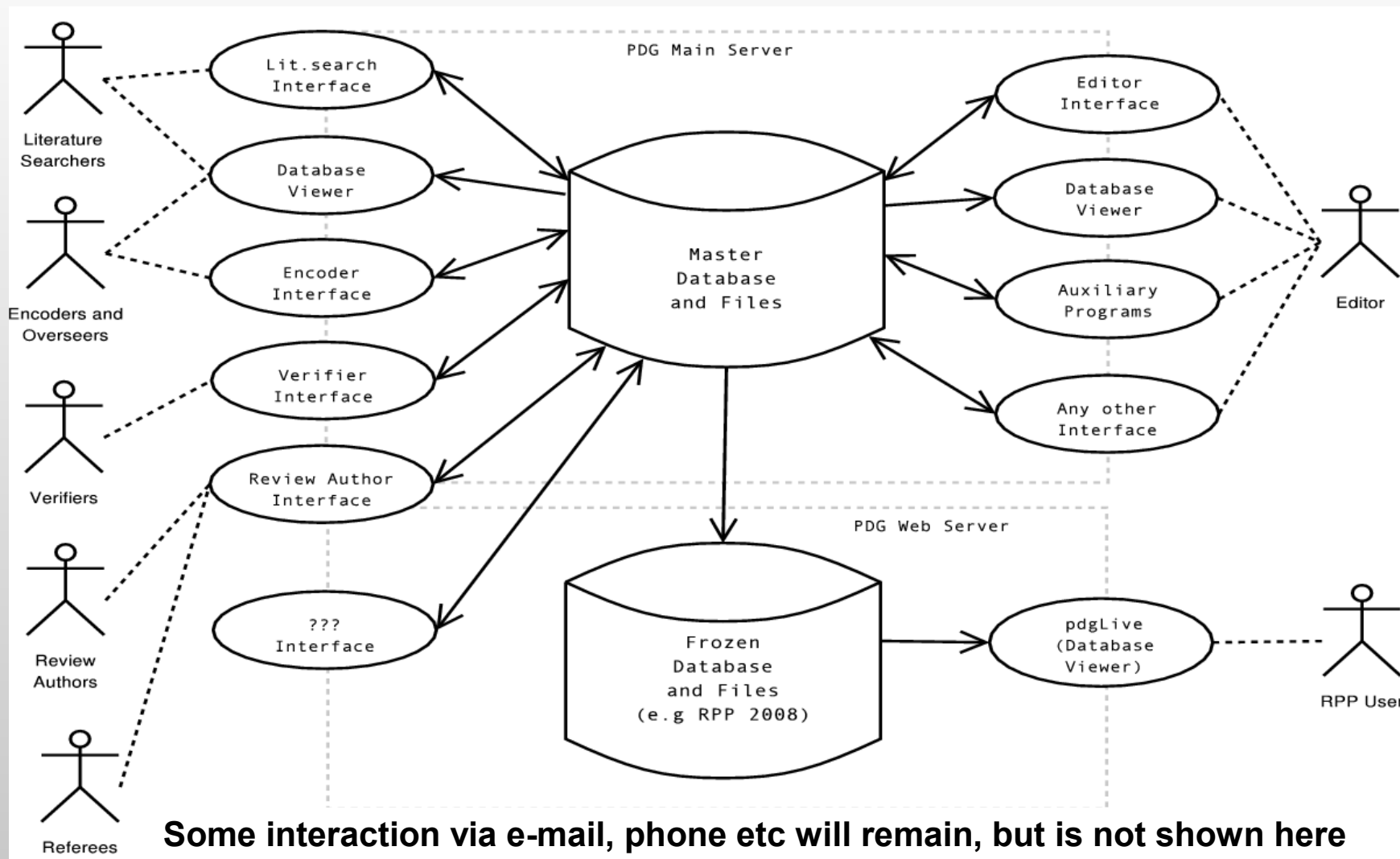
(in addition to 24,559 measurements from 7,104 papers that first appeared in previous editions)

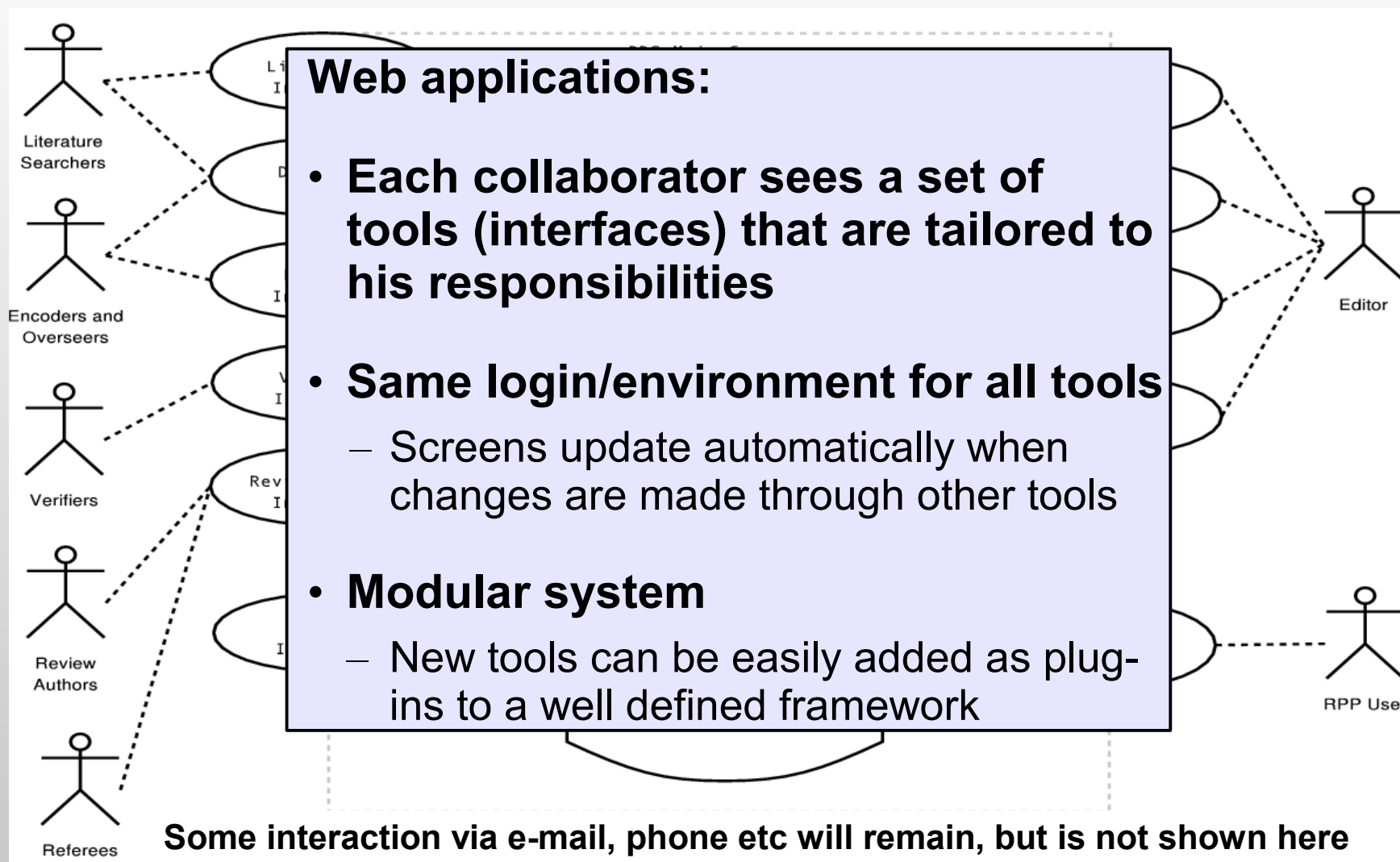
108 reviews written by experts

RPP: 1344 pages

Booklet: 294 pages



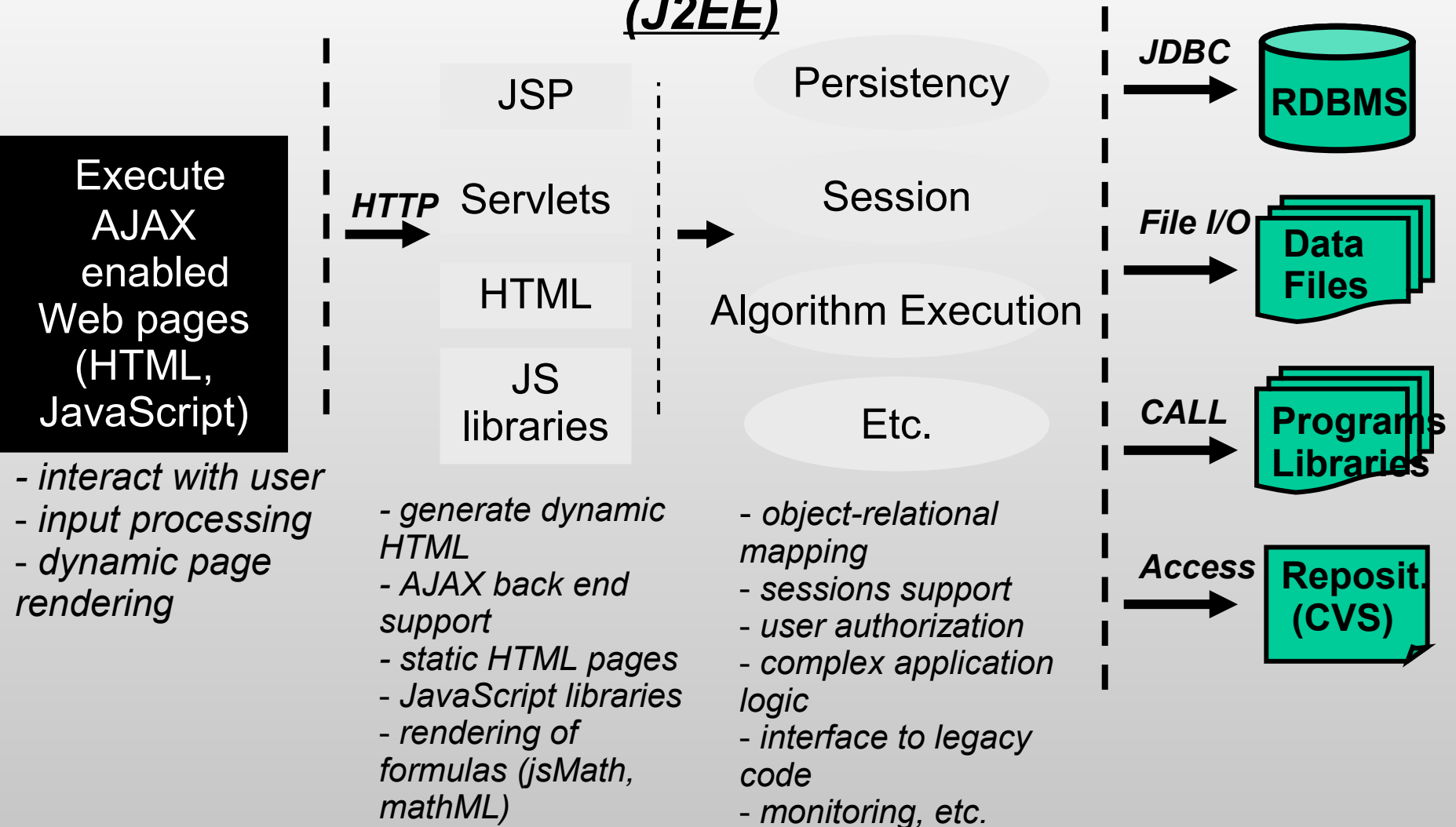




Web Browser

Web Application Server (J2EE)

Resources



- **J2EE-based web application framework**
 - Commonly used industry standard for building scalable, distributed web applications
- **AJAX-enabled web pages**
 - User-friendly and highly interactive GUI behavior
- **Relational database (PostgreSQL)**
 - $O(100)$ database tables
- **Programming languages**
 - Java and JSP for web application framework backend
 - JavaScript for client-side HTML (AJAX)
 - Python API for programmatic access to database
 - Legacy Fortran applications restructured as libraries