Gauge bosons (W/Z) in PDG-RPP

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(Encoders/Overseers)

Evolution of statistics

- **Papers read:**

1992	94	96	98	2000	02	04	06	08	10
?	80	86	93	98	83	31	49	44	37

- **Nodes (Particle properties):**

	1992	94	96	98	2000	02	04	06	08	10
Z	47	75	107	128	134	134	140	145	148	152
W		14	14	15	28	30	30	34	34	34

- **Pages in RPP**

	1992	94	96	98	2000	02	04	06	08	10
Z	7	13	15	18	18	20	21	22	21	22
W	2	3	3	5	7	7	7	7	7	8

Brief recapitulation

- **1992-2002: period of intense activity in W/Z, with LEP (ADLO), SLC (SLD), TEVATRON Run-I (CDF, D0) producing a torrent of data and publications.**

- **The number of NODES and PAGES in RPP increased by a factor of 3.**

- **LEP: To obtain best LEP average measurements, results from the four experiments obtained over several years had to be combined using averaging procedures which accounted for correlated errors.**

  → role of LEP working groups (see next slide).

Working groups LEP, Tevatron

- **LEP Working groups devised proper averaging procedures to account for correlations**
  - **between experiments (same beams/M.C. models/ theory input to extract measurements)**
  - **between different data runs/ years**
  - **due to use of > 1 measurements within a fit to extract the best value of a quantity**

- **LEP Electroweak Working Group; LEP W-group**
  Klaus Monig => CC for Z -> b bbar/c cbar
  AG for Z-lineshape, W-mass, branching ratios
  THIS LEP WG → PDG INTERFACE PLAYED A CRITICAL ROLE OVER THE YEARS.

- **Now TEVATRON EWWG has taken shape and plays a similar role for RUN-II data on W and Z – Martin Grunewald.**

Mini-reviews

- **PDG: Providing world averages a crucial task (most quoted reference).**
- **Consequence of complicated averaging procedures: Long mini-reviews as explanations**
  →Notes on Z-boson, W-mass.
- **Mini-reviews also useful to**
  Clarify terminology, give latest preliminary results on important quantities.

Mini-reviews - 2

- **Other mini-reviews:**
  on W-TGC's (gamma WW, ZWW),
  ZZγ, Zγγ, ZZV Couplings
  Anomalous W/Z Quartic couplings.

- **All are revised for every hardcopy/WEB edition, and a new one written if necessary.**

- **For RPP06, a critical evaluation was carried out of the Z mini.**
  Sent to expert referees, who made a number of suggestions for improvement and for correction (e.g. in references).
  For RPP08 MG suggested some changes and these are incorporated.

  →This turned out to be a very worthwhile exercise and we believe the Z mini definitely reads better !

Expectations for W/Z for RPP 2010 (as seen in Oct 2008)

- **Remnant LEP averaging will be available.**
- **New results from Tevatron Run II:**
  on many measurements on W, Z, including mass, width, BR's, couplings. More accurate W mass would make Higgs mass prediction more precise to confront with LHC (or even Tevatron). With delay in LHC startup Tevatron could have a slightly prolonged role to play (modulo funding).
- **We hope LHC will become operational in 2009 and some results on W/Z make it for RPP 10.**

Actual situation in RPP-2010

- LEP: Some results still need to be finalized (W-mass and width combination needing final correlation between the experiments). Summer 2011…
- Tevatron experiments have made a real dent in precision determination of W-mass and width.

  For the 1st time the Tevatron W-mass is better than LEP average.
- **LHC results not yet available. Wait till 2012 edition.**

Expectations for 2012

- Even further improvements on W parameters from Tevatron: W-mass, width, TGC's etc

- Certainly contributions from the LHC on properties, couplings related to W and Z. (Rediscovery of SM physics, possible surprises? In TGC's?)

Replacement of AG

- At 65, will be retiring at end-Jan 2011
- Brief discussion with Michael: retirement not a deterrent and will continue for 2012 edition.
- Could try to see how things go, and if necessary one has somewhat over one year to find a replacement.

Thank you.