



Standard Model Session

INTRODUCTION

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Plans of Italian Groups for Run1/2

BOLOGNA

- **Z counting & Z cross-section:**

- Luminosity Monitor quasi-online (possibly also on-line) using Z counting method and contribution to Z cross-section measurement at 13 TeV.

Contacts: *L. Fabbri, B. Giacobbe, M. Sioli*

LECCE

- **ZZ-->4l final state from VBS aiming at constraining aQGC**

- General signal selection, background estimate, cross section measurements, extraction of constraints on anomalous gauge couplings
- Investigate the feasibility and potential of the 2l2b(or 2l2c) final state (still in the VBS topology) "

Personpower: *G.Chiodini, S.Spagnolo, D.Bachas*

MILANO

- **Inclusive cross sections and differential distributions**

- 2γ , 2γ +jets (*M. Fanti*)

- **γ +jet**

- Finalizing RUN1 paper, then prepare for analysis in RUN2 (*L. Carminati, M. Villaplana*)

ROMA1

- **Low Mass Drell-Yan measurement:**
 - Ongoing study on dedicated trigger for RUN2
 - Direct access to quark PDF info at low-x

Contacts: *M. Corradi*

PISA

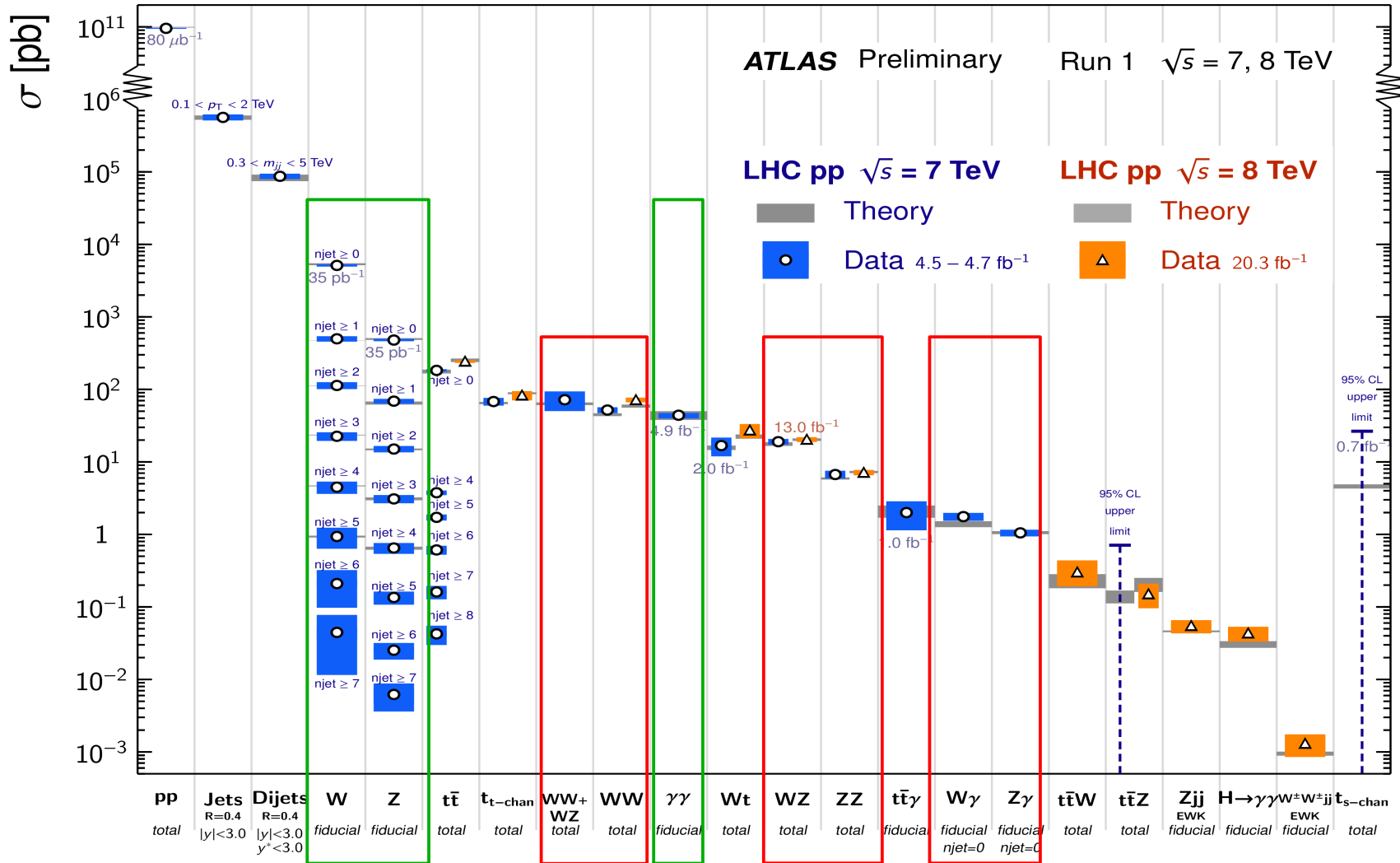
- **WV->lvjj 8 TeV analysis (RUN I)**
 - Aim to publish in summer
- **WV->lvJ, lvjj at 13TeV**
 - Analysis to be done with 5fb-1
 - Limits on W' , graviton
 - Nice check of the eventual VV->JJ peak

People involved: *N.Biesuz, C.Roda, M.Spalla, T.Del Prete, F.Bertolucci, V.Cavasinni, S.Leone, F.Scuri*

Standard Model RUN1 Summary Plot

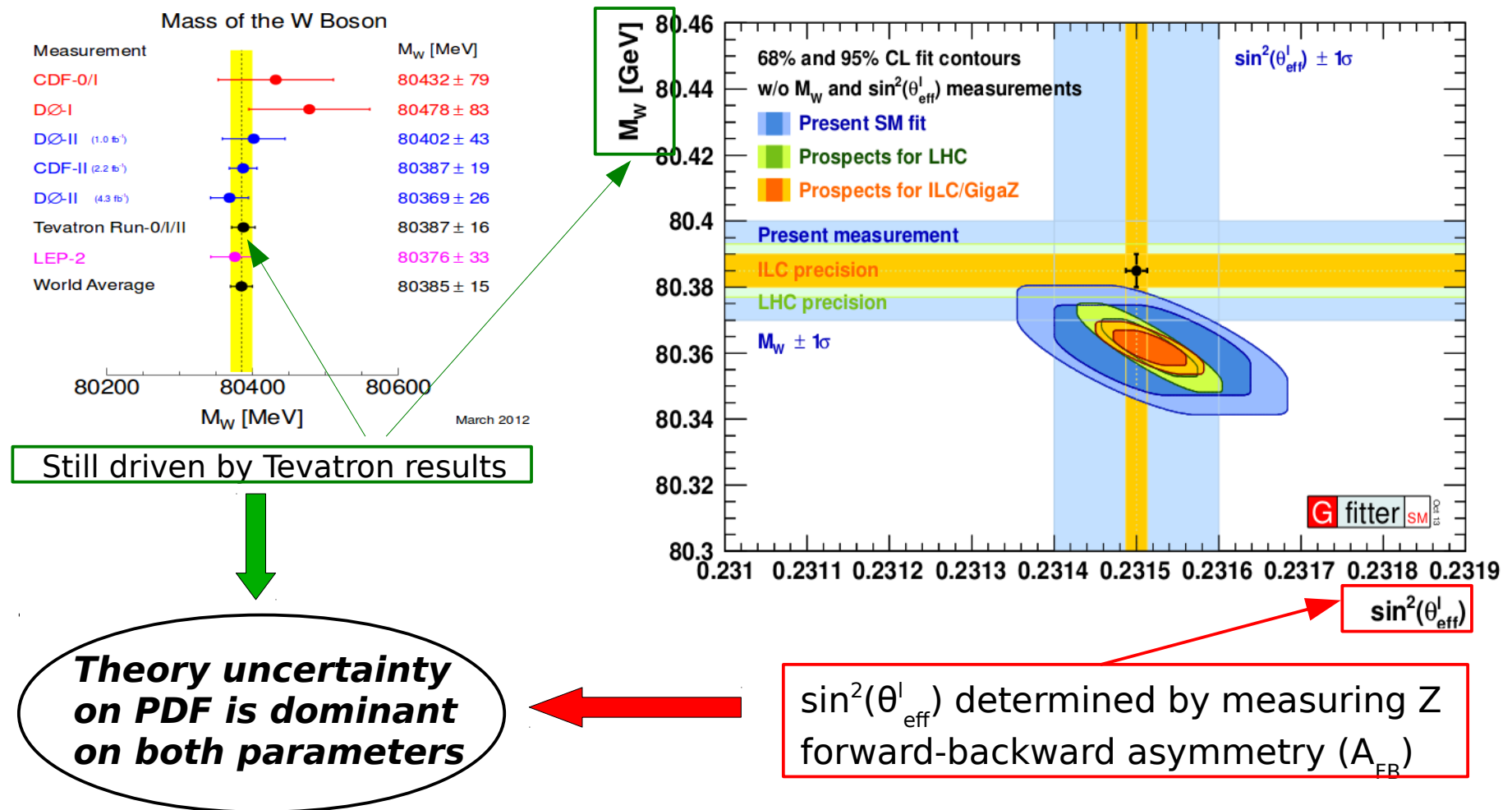
Standard Model Production Cross Section Measurements

Status: July 2014



Standard Model in RUN2, Why?

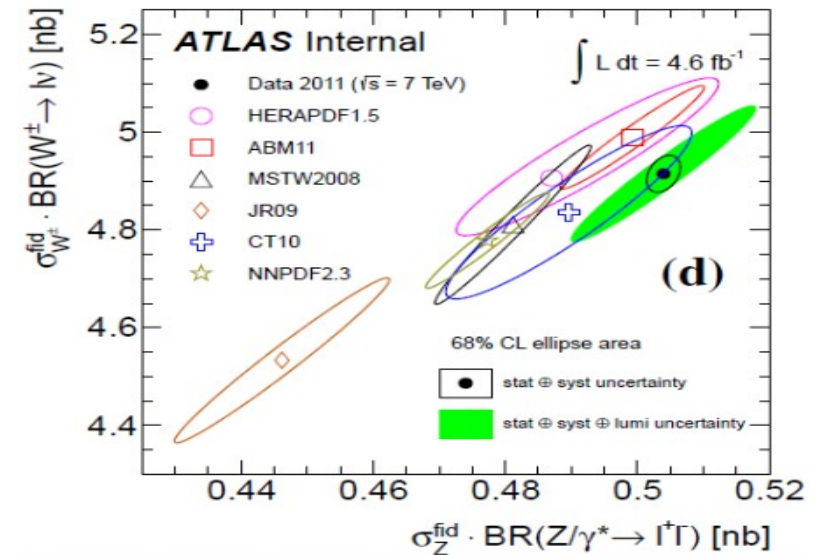
- Standard Model studies in ≥ 2014 as indirect search of new physics
 - Precision observables are important to characterize new physics...if any



New CM Energy (13 TeV)--->New SM and PDFs

SM measurements on W/Z bosons provide powerful constrain and improvement on different PDF sets

- Asimmetry(W) sensitive to valence quark distribution via ptoction: $ud(u\bar{d}) \rightarrow W^{+(-)}$
- W production in association with charm quarks provide info on strange PDF



New CM Energy (13 TeV)--->New anomalousGC era

TGC and QGC (not yet measured in ATLAS) obtained from Multi-Boson production analys ----> Higher luminisoty and CM energy needed due to small xsec of the processes

$$\mathcal{L}_{EFT} = \mathcal{L}_{SM} + \sum_{i=WWW, W, B, \Phi W, \Phi B} \frac{c_i}{\Lambda^2} \mathcal{O}_i + \sum_{j=0,1} \frac{f_{S,j}}{\Lambda^4} \mathcal{O}_{S,j} + \sum_{j=0,\dots,9} \frac{f_{T,j}}{\Lambda^4} \mathcal{O}_{T,j} + \sum_{j=0,\dots,7} \frac{f_{M,j}}{\Lambda^4} \mathcal{O}_{M,j}$$

- If $\Lambda \gg$ experimentally accessible scale, i.e. $O(1-2 \text{ TeV})$, the SM is a low (compared to Λ) effective theory
- Both TGC and QGC in **dimension 6** operators, **dimension 8** add genuine QGC

EFT offers a good opportunity for model independent BSM new physics search but need a careful treatment of unitarity validity

ATLAS dedicated Workshop last week (2-5 Febraury)

SM Workshop at LAPP - Lessons from Run 1 and Preparation for Run 2

<https://indico.cern.ch/event/345914/other-view?view=standard>

Talks in today Agenda

1) *Prime misure Standard Model @ RUN2*

- **Valentina Cairo** (phd student) INFN COSENZA

2) *Misure mature Standard Model @ RUN2*

-**Margherita Spalla** (phd student) INFN PISA