

# Plans for the next 12/18 months

- LHC has entered a new phase of Precision Physics studies  
Collaboration between different communities is desirable for a consistent global data interpretation  
Restart in a systematic way the Electroweak Working Group activities  
(kick-off mini-workshop in the week of November 27th)
- Enlarge the scope of the WG:  
not only precision measurements ( $M_W$ ,  $\sin^2\theta_W$ ), but also di- and multiboson (AGC) studies  
interplay with other communities (QCD, PDFs,...)
- Several new conceptual and technical questions are constantly raising, so that
  - a forum for discussion is useful
  - the identification of specific tasks may help to focus the discussion and come to concrete solutions
- regular meetings: how frequent? which format?  
in each meeting we could report the progresses on one topic and address the next topic of interest  
3 or 4 general meetings (2/3 days long) per year, subgroups may organise dedicated topical sessions  
if useful, we can repeat the format working+general meeting in one week, as here in Orsay
- outcome of the activities could appear in a report (published in a journal?) next year

# Collecting results in a report

- we would like to identify topics that (urgently) need discussion/clarification/new tools development; suggestions are collected starting now and until the mini-workshop at CERN end of November
- outcome of the survey → tentative skeleton of this report to be discussed in the mini-workshop with chapters and people in charge of each section (if we all agree that writing a report makes sense)
- progress in the prediction of kinematical distributions with improved calculations and simulations  
→ validation (benchmarking) and correct usage of simulation tools
- progress in the methodologies to determine a pseudo-observable ( $M_W$ ,  $\sin^2\theta_W$ ,...)  
from the shape of several kinematical distributions  
→ how shall we compute a theoretical uncertainty  
in presence of model dependence, of correlations between the distributions ?

# Starting list of topics

## Lepton-pair transverse momentum distributions

- comparison of different QCD Parton Shower models (including recent ones like Vincia, Dire)
- solution to backward evolution issue (forward evolution, 4FS+5FS combinations,...)
- comparison of analytical predictions up to N<sup>3</sup>LL+N<sup>3</sup>LO
- flavour dependent intrinsic  $k_T$
- heavy flavour contributions (PDF dependence and kinematical effects, analytic resummation)

## PDF studies

- requirements on PDFs for EW predictions
- PDF including resummation effects
- QCD scale variations in PDF fits

## Global analyses

- W/Z decomposition / correlation (e.g. table with resummation coefficients for W and Z)
- PDF correlations / reweighing techniques
- improving tools/interfaces to ease the benchmarking of new tools with existing results

# Starting list of topics

## Electroweak corrections

- photon veto checks (standardise MC vs PS interfaces in presence of QED)
- EW input schemes  
consistent use of input parameters allows to combine measurements/PDFs  
 $\sin^2\theta_W(\text{on-shell})$  vs  $\sin^2\theta_W(\text{lep,eff})$
- fermion-pair emission modelling: comparison of different tools (Pythia/PHOTOS/SANC/Horace)
- verify/quantify  $A_i$  decomposition breaking in presence of radiation

## $\sin^2\theta_W$ determination

- differences between  $A_{\text{FB}}$  and  $A_i$  determinations
- PDF uncertainties
- verify  $A_{\text{FB}}$  templates under  $\sin^2\theta_W$  variations, at LO and NLO EW