

# TeV4LHC Workshop

Fermilab October 21, 2005

**EW theory section of the report**

# Proposed outline

**1. Introduction** (jointly with exp. Section ?)

**2. Overview of available calculations for single W/Z production that include EW radiative corrections:**

HORACE

WGRAD/ZGRAD

WINHAC/ZINHAC(?) (+SANC (?))

S.Dittmaier/M.Kraemer

RESBOS

W/Z  $\gamma$  distributions at NNLO, PYTHIA+PHOTOS(?)

[Diboson production (?)]

# Proposed outline (2)

## 3. Tuned Comparison for single W production (also for Z (?)) of

$\sigma_W$

$d\sigma/dM_T(l\nu)$

$d\sigma/dp_T(l)$

$d\sigma/dy_W$  (charge asymmetry)

**LHC/Tevatron :  $p_T(l) > 25$  GeV,  $E_T^{\text{miss}} > 25$  GeV,  $|\eta_l| < 1.2$ ,  
photon-lepton recombination cuts**

# Proposed outline (3)

## 4. Assessment of residual theoretical uncertainties (?)

- Missing higher order corrections (from tuned comparison, EW Sudakov logs, renormalization scheme dependence,...)
- PDF uncertainties
- $q_T$  resummation (small  $x$  effects)

As uncertainties in cross sections ( $d\sigma/dM_T$  etc.) and/or in terms of uncertainty in  $M_W$  (for different exp. methods),  $\Gamma_W$ , extraction of quark PDFs, luminosity, ... (?)

## 5. Summary table (jointly with exp. Section)

Present and anticipated experimental uncertainties confronted with theoretical uncertainties -> Conclusions for the Tevatron and the LHC