

Model independent  
measurement discussion points

For the following proposals, discuss

1. any model dependence they introduce
2. how concerning/severe that might be
3. how you might mitigate it

1. I want to measure di-electron (Drell-Yan) production inclusively in pp collisions. My electromagnetic calorimeter has an insensitive area at  $0.1 > \phi > -0.1$ , and I would like to extrapolate over this using simulation to produce a more inclusive measurement.
2. In the same measurement I would like to unfold to “born” electrons
3. In the same measurement I would like to subtract the background from WW and tt events.
4. In the same measurement I have a fiducial phase space defined by cuts on the electrons at  $p_T > 10$  GeV and  $|y| < 2$ , because of acceptance of the trigger, tracking and EM calorimeter. I would like to extrapolate to the full phase space.
5. Would (4) be a better or worse thing to do if measuring di-electrons at LEP? What about dimuons?

1. I want to measure  $WW$  production in  $pp$  collisions at the LHC. I want to use leptonic events, but measure the total cross section, so would like to correct for the leptonic  $W$  branch ratio
2. In the same measurement I define a fiducial phase space using a selection cut on missing energy at 20 GeV, as well as on the  $p_T$  of and  $y$  of the leptons  $p_T > 10$  GeV and  $|y| < 2$ . The muon detector has a few percent inefficiency depending upon the layout of the material in front of it. I want to correct for that.
3. The missing energy trigger has a turn-on curve which means it is 95% efficient at 20 GeV, only reaching 100% at 30 GeV. I want to correct for this.
4. In the same measurement I am not interested in  $W$ s from tops, so I want to subtract them.
5. I am actually keen on vector-boson scattering, so I want to correct back to just this process
6. I want to be inclusive so I want to correct from the fiducial phase space to the full phase space

## Questions:

- 1 Why do EW corrections generally increase with the typical momentum transfer of the interaction?
- 2 How do EW PDFs differ from the standard QCD ones?
- 3 Can an existing parton shower easily accommodate EW splitting functions?
- 4 How can NLO EW corrections be incorporated in event generators?

# Questions

- ❑ **How does one distinguish  $h \rightarrow WW \rightarrow ll + \nu_s$  from  $h \rightarrow \tau\tau \rightarrow ll + \nu_s$**
- ❑ **Why is  $h \rightarrow \tau\tau$  observed and measured in VBF and boosted topologies?**
- ❑ **Why is the  $h \rightarrow WW \rightarrow ll + \nu_s$  search and measurements performed jet bins?**
- ❑ **What are the shortcomings of the “kappa” framework?**