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CERN TH Retreat

Les Houches - November 2013

Interests

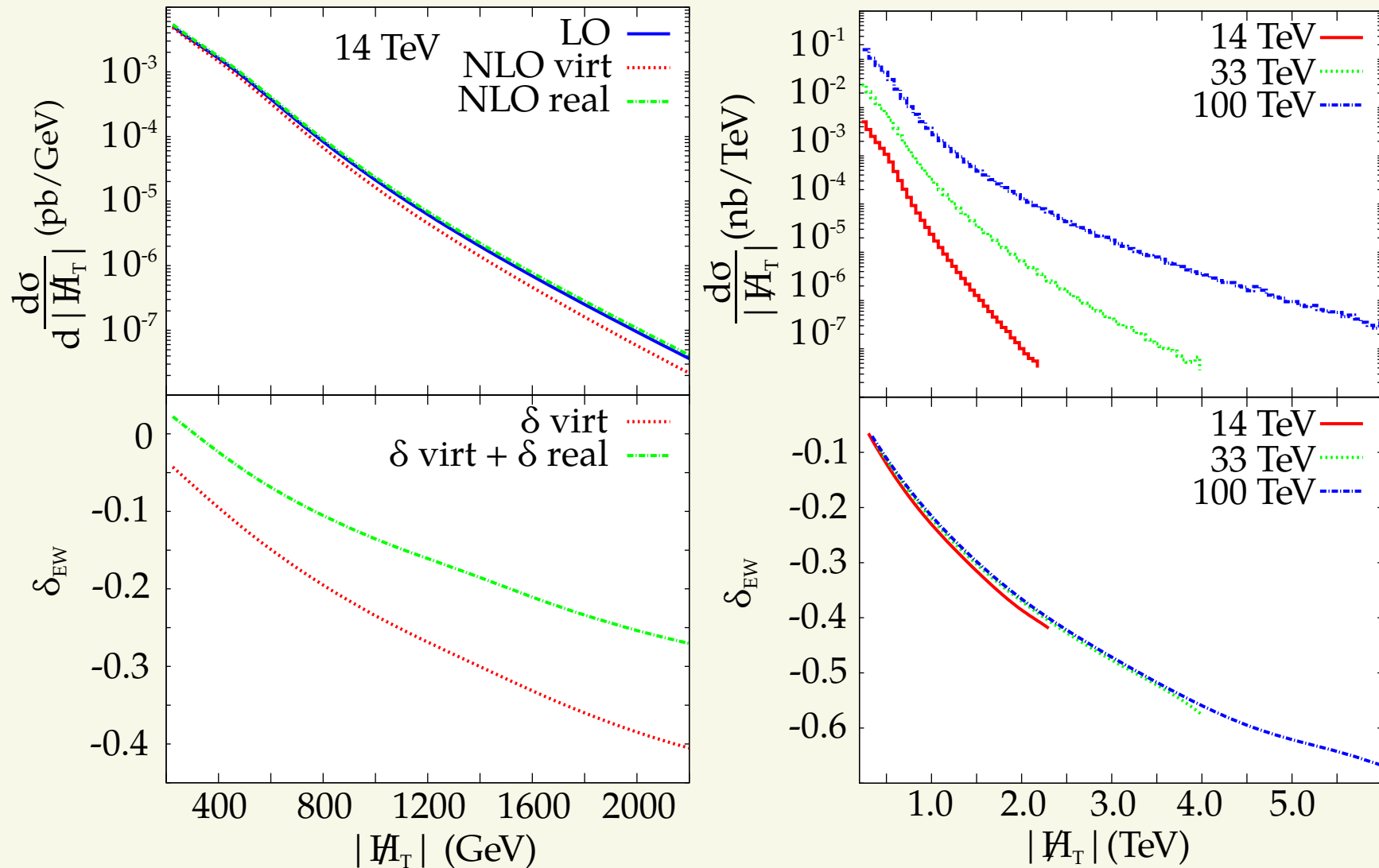
- ElectroWeak corrections (sometimes) matter at hadron colliders:
 - high precision physics (W mass) - Drell-Yan processes
 - QCD \otimes EW NLO w Parton Shower JHEP 1204 (2012) 037
EPJC73 (2013) 2474
 - sometimes become “strong”
 - high energies - background to New Physics
- γ s in final state ($W\gamma$ coupling)
- pheno studies
 - $t\bar{t}b\bar{b} / n$ (up to 10) jets / asymmetry in $t\bar{t}\gamma$

$Z(\nu\bar{\nu}) + 2/3$ jets leading EW NLO

arXiv:1308.1430
arXiv:1310.5189
PRL 111 (2013) 121801

In the Sudakov limit (energy scales $\gg M_V^2$) leading EW corrections factorize on the Born (and $SU(2)$ -correlated) matrix element

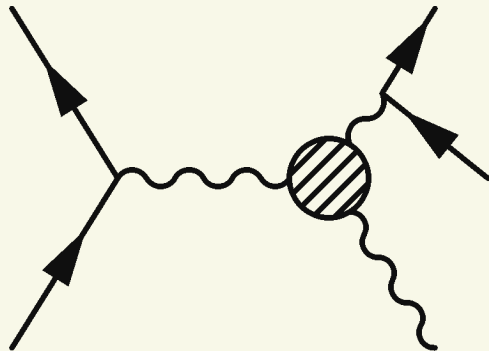
$Z(\nu\bar{\nu}) + 3j$ with ALPGEN



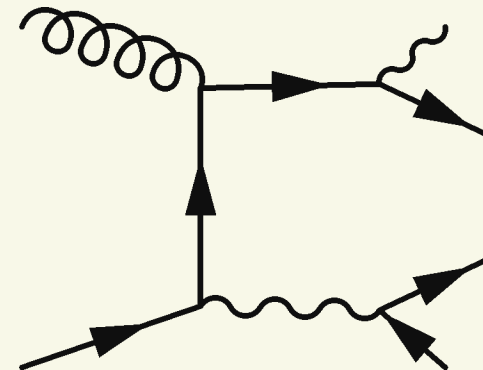
Open problem:

→ γ s in final state when matching Parton Shower with NLO

Triple gauge couplings
measurement



At NLO fragmentation
contribution:



usually fragmentation function (\sim PDF) or isolation are used

→ but are incompatible with Parton Shower;

? use the Parton Shower itself for photon emission ?

ongoing work with POWHEG, no trustable results yet, but we're (hopefully) on the right way.

Conclusions

- NLO Electroweak will matter in high energies limit;
- in this limit it's easier to calculate them;
- process with final state photons are important for LHC.

Not answered question

- LHC energy is *high*?
- Should we take into account NNLO/resummation? (how?)
- Parton showers are good approximations of fragmentation functions?