

Les Houches wishlist 2013

Here is a very rough draft of the wishlist for Precision Calculations discussed on Wednesday morning. Please feel free to suggest modifications and improvements.

Thanks, Nigel and Stefan

References

- [1] G. 't Hooft and M. J. Veltman, Nucl. Phys. B **153** (1979) 365.

Process	known	desired	details
H + j	$d\sigma(\text{gg}) @ \text{NNLO QCD}$ $d\sigma @ \text{NLO EW}$	$d\sigma$ @ NNLO QCD + NLO EW	
H + 2j	$\sigma_{\text{tot}}(\text{VBF}) @ \text{NNLO(DIS) QCD}$ $d\sigma(\text{gg}) @ \text{NLO QCD}$ $d\sigma(\text{VBF}) @ \text{NLO EW}$	$d\sigma$	
H + V	$d\sigma @ \text{NNLO QCD}$ $d\sigma @ \text{NLO EW}$		
$t\bar{t}H$	$d\sigma(\text{stable tops}) @ \text{NLO QCD}$	$d\sigma(\text{top decays})$ @ NLO QCD + NLO EW	

Table 1: Wishlist part 1 – Higgs (V = W, Z)

Process	known	desired	details
$t\bar{t}$	σ_{tot} @ NNLO QCD $d\sigma(\text{top decays})$ @ NLO QCD $d\sigma(\text{stable tops})$ @ NLO EW	$d\sigma(\text{top decays})$ @ NNLO QCD + NLO EW	with top decays
$t\bar{t} + j$	$d\sigma(\text{NWA top decays})$ @ NLO QCD		
single-top			
dijet	$d\sigma(\text{gg})$ @ NNLO QCD $d\sigma$ @ NLO weak	$d\sigma$ @ NNLO QCD + NLO EW	
3j	$d\sigma$ @ NLO QCD	$d\sigma$ @ NNLO QCD + NLO EW	
$\gamma + j$			$\gamma + b$ for bottom PDF

Table 2: Wishlist part 2 – jets and heavy quarks

Process	known	desired	details
$V + j$	$d\sigma(V \text{ decay}) @ \text{NLO QCD}$ $d\sigma(V \text{ decay}) @ \text{NLO EW}$	$d\sigma(V \text{ decay})$ @ NNLO QCD + NLO EW	Z + j for gluon PDF W + c for strange PDF
VV'	$d\sigma(V \text{ decays}) @ \text{NLO QCD}$ $d\sigma(\text{stable } V) @ \text{NLO EW}$	$d\sigma(V \text{ decays})$ @ NNLO QCD + NLO EW	off-shell leptonic decays
$Vb\bar{b}$			background for $VH \rightarrow b\bar{b}$
$\gamma\gamma$	$d\sigma @ \text{NNLO QCD}$		

Table 3: Wishlist part 3 – EW gauge bosons ($V = W, Z$)