

# Status of SM background simulation

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With

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# Delphes Release and Cards for Signal and background

We plan to use the new Delphes 3.0.8, with the following configuration along with 14 TeV pileup files for HT binned samples.

1. The src code can be found at:

<http://cmssw.cvs.cern.ch/cgi-bin/cmssw.cgi/UserCode/spadhi/Snowmass/Delphes/Delphes-3.0.8.tar.gz?view=log>

2. Pileup files at 14 TeV

[http://uaf-2.t2.ucsd.edu/~spadhi/Snowmass/data/MinBias100K\\_14TeV.pileup](http://uaf-2.t2.ucsd.edu/~spadhi/Snowmass/data/MinBias100K_14TeV.pileup)

3. Delphes optimized cards for 0 , 50, 140 and VLHC (cvs head version)

[http://cmssw.cvs.cern.ch/cgi-bin/cmssw.cgi/UserCode/spadhi/Snowmass/Cards/delphes\\_card\\_Snowmass\\_NoPileUp.tcl?view=log](http://cmssw.cvs.cern.ch/cgi-bin/cmssw.cgi/UserCode/spadhi/Snowmass/Cards/delphes_card_Snowmass_NoPileUp.tcl?view=log)

[http://cmssw.cvs.cern.ch/cgi-bin/cmssw.cgi/UserCode/spadhi/Snowmass/Cards/delphes\\_card\\_Snowmass\\_50PileUp.tcl?view=log](http://cmssw.cvs.cern.ch/cgi-bin/cmssw.cgi/UserCode/spadhi/Snowmass/Cards/delphes_card_Snowmass_50PileUp.tcl?view=log)

[http://cmssw.cvs.cern.ch/cgi-bin/cmssw.cgi/UserCode/spadhi/Snowmass/Cards/delphes\\_card\\_Snowmass\\_140PileUp.tcl?view=log](http://cmssw.cvs.cern.ch/cgi-bin/cmssw.cgi/UserCode/spadhi/Snowmass/Cards/delphes_card_Snowmass_140PileUp.tcl?view=log)

[http://cmssw.cvs.cern.ch/cgi-bin/cmssw.cgi/UserCode/spadhi/Snowmass/Cards/delphes\\_card\\_Snowmass\\_VLHCPileUp.tcl?view=log](http://cmssw.cvs.cern.ch/cgi-bin/cmssw.cgi/UserCode/spadhi/Snowmass/Cards/delphes_card_Snowmass_VLHCPileUp.tcl?view=log)

The detector performance remains the same (as shown during the BNL meeting)

One minor fix needed for STDHEP files.

# Standard Model backgrounds

Process	Order	14 TeV	33 TeV	100 TeV
Dominant Backgrounds				
$B + n_4 J$	$\mathcal{O}(\alpha_s^{n_4} \alpha_w)$	SGlKp	sk	sk
$TT + n_3 J$	$\mathcal{O}(\alpha_s^{2+n_3})$	SGlKp	sk	sk
$BB + n_2 J$	$\mathcal{O}(\alpha_s^{n_2} \alpha_w^2)$	SGk	sk	sk
$TB + n_2 J$	$\mathcal{O}(\alpha_s^{n_2+1} \alpha_w)$	SGk	sk	sk
$T + n_3 J$	$\mathcal{O}(\alpha_s^{n_3-1} \alpha_w^2)$	SGk	sk	sk
$LL + n_3 J$	$\mathcal{O}(\alpha_s^{n_3} \alpha_w^2)$	SGk	sk	sk
Subdominant Backgrounds				
$TTB + n_1 J$	$\mathcal{O}(\alpha_s^{2+n_1} \alpha_w)$	k	k	k
$BLL + n_1 J$	$\mathcal{O}(\alpha_s^{n_1} \alpha_w^3)$	k	k	k
$B + n_3 J$	$\mathcal{O}(\alpha_s^{n_3} \alpha_h)$	K		
$B + n_3 J$	$\mathcal{O}(\alpha_s^{n_3-2} \alpha_w^3)$	(B=w+,w-,Z,gamma)		

Matched, 4-parton final states

Binned in  $HT^*$  -- scalar sum of generator-level  $p_T$

Dominant: 4-7 bins of HT  
Subdominant: 2-3 bins of HT  
5M events per bin

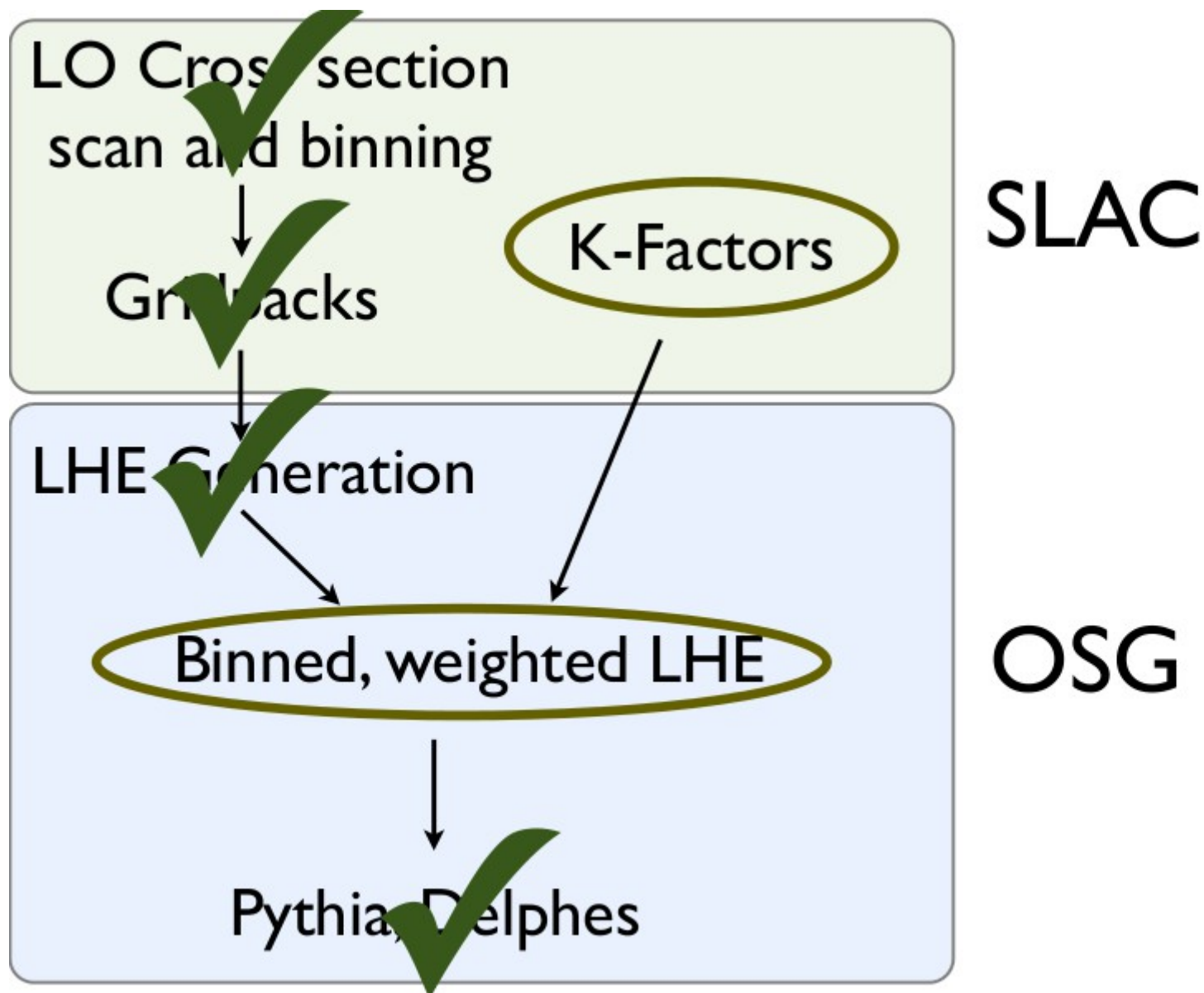
Rare backgrounds - no binning

$H_{T \min}$	$H_{T \min}$	$\sigma_{MG}$	$N_{events}$
0	300		5M
300	600		5M
600	1100		5M
1100	1800		5M
1800	2700		5M
2700	3700		5M
3700	—		5M

Gridpacks are ready for 14 TeV samples:

- <http://www.stanford.edu/~howek/SnowmassBackgrounds/14TeV/>

# Standard Model backgrounds - Workflow



# Standard Model backgrounds

The plan is to keep the LHE workflows running on the OSG during the weekend.

We plan to start Pythia+Delphes production to dedicated sites on Monday.

- CMS : FNAL, UNL, UCSD and Wisconsin

- ATLAS : BNL, MWT2, AGLT2

Delphes (50 PU) ~ 140 events/min

Delphes (140 PU) ~ 90 events/min

The final output will be located at:

<http://red-gridftp11.unl.edu/Snowmass/>

We expect the major backgrounds for 14 TeV with 3000 fb<sup>-1</sup> stat. to be done by next week

We will send the details to the snowmass-ef list as soon as a set of output files are available