

# Weekly Updates

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# Updates

- Explanation of signal samples, re-phrasing many small parts.
- Add summary.
- Change the order of author list
- Fill values in the table ... one table (Table2) is still empty.
  - > except for this part, that could be the very first draft ( probably, the title was considered at the early time, therefore, at least, title/abstract/summary shall be re-considered at the end )

**Table 1** Overview of the requirements applied when selecting events.

Pre-selections		
$N(l) = 2$ , where leptons(l) should pass the isolation criteria		
$N(\mu^+) = 1, N(\mu^-) = 1$ with $E(\mu^\pm) > 3$ GeV		
$N(jet) = 2$		
$\mu\mu H\nu qq$	$\mu\mu Hqq\nu\nu$	$\nu\nu H\mu\mu qq$
$80 \text{ GeV} < M_{\mu\mu} < 100 \text{ GeV}$	$80 \text{ GeV} < M_{\mu\mu} < 100 \text{ GeV}$	$60 \text{ GeV} < M_{\mu\mu} < 100 \text{ GeV}$
$15 \text{ GeV} < M_{jj} < 60 \text{ GeV}$	$60 \text{ GeV} < M_{jj} < 105 \text{ GeV}$	$10 \text{ GeV} < M_{jj} < 55 \text{ GeV}$
$75 \text{ GeV} < M_{\text{mix.}} < 105 \text{ GeV}$	$10 \text{ GeV} < M_{\text{mix.}} < 55 \text{ GeV}$	$75 \text{ GeV} < M_{\text{mix.}} < 110 \text{ GeV}$
$110 \text{ GeV} < M_{\mu\mu}^{\text{recoil}} < 140 \text{ GeV}$	$110 \text{ GeV} < M_{\mu\mu}^{\text{recoil}} < 140 \text{ GeV}$	$110 \text{ GeV} < M_{\text{vis.}} < 140 \text{ GeV}$
	$175 \text{ GeV} < M_{\text{vis.}} < 215 \text{ GeV}$	
$20 < N_{\text{PFO}} < 90$	$30 < N_{\text{PFO}} < 100$	$20 < N_{\text{PFO}} < 60$
$ \cos \theta_{\text{vis.}}  < 0.95$	$ \cos \theta_{\text{vis.}}  < 0.95$	$ \cos \theta_{\text{vis.}}  < 0.95$
$60^\circ < \Delta\phi_{ZZ} < 170^\circ$	$120^\circ < \Delta\phi_{ZZ} < 170^\circ$	$\Delta\phi_{ZZ} < 135^\circ$
$ M_{\text{vis.}} - M_H  > 3 \text{ GeV}$	$ M_{jj}^{\text{recoil}} - M_H  > 3 \text{ GeV}$	$ M_{\mu\mu}^{\text{recoil}} - M_H  > 3 \text{ GeV}$
$\nu\nu Hqq\mu\mu$	$qqH\nu\nu\mu\mu$	$qqH\mu\mu\nu\nu$
$10 \text{ GeV} < M_{\mu\mu} < 60 \text{ GeV}$	$15 \text{ GeV} < M_{\mu\mu} < 55 \text{ GeV}$	$75 \text{ GeV} < M_{\mu\mu} < 100 \text{ GeV}$
$60 \text{ GeV} < M_{jj} < 100 \text{ GeV}$	$75 \text{ GeV} < M_{jj} < 105 \text{ GeV}$	$75 \text{ GeV} < M_{jj} < 110 \text{ GeV}$
$75 \text{ GeV} < M_{\text{mix.}} < 110 \text{ GeV}$	$70 \text{ GeV} < M_{\text{mix.}} < 110 \text{ GeV}$	$10 \text{ GeV} < M_{\text{mix.}} < 50 \text{ GeV}$
$110 \text{ GeV} < M_{\text{vis.}} < 140 \text{ GeV}$	$110 \text{ GeV} < M_{\text{vis.}}^{\text{recoil}} < 140 \text{ GeV}$	$110 \text{ GeV} < M_{\text{vis.}} < 140 \text{ GeV}$
$165 \text{ GeV} < M_{\mu\mu}^{\text{recoil}} < 215 \text{ GeV}$	$175 \text{ GeV} < M_{\mu\mu}^{\text{recoil}} < 215 \text{ GeV}$	$115 \text{ GeV} < M_{\mu\mu}^{\text{recoil}} < 140 \text{ GeV}$
	$115 \text{ GeV} < M_{\text{vis.}} < 155 \text{ GeV}$	$185 \text{ GeV} < M_{\text{vis.}} < 215 \text{ GeV}$
$30 < N_{\text{PFO}} < 100$	$40 < N_{\text{PFO}} < 95$	$35 < N_{\text{PFO}} < 100$
$ \cos \theta_{\text{vis.}}  < 0.95$	$ \cos \theta_{\text{vis.}}  < 0.95$	$ \cos \theta_{\text{vis.}}  < 0.95$
$\Delta\phi_{ZZ} < 130^\circ$	$120^\circ < \Delta\phi_{ZZ} < 170^\circ$	$120^\circ < \Delta\phi_{ZZ} < 170^\circ$
$ M_{jj}^{\text{recoil}} - M_H  > 3 \text{ GeV}$	$ M_{\nu\nu}^{\text{recoil}} - M_H  > 3 \text{ GeV}$	$ M_{\mu\mu}^{\text{recoil}} - M_H  > 3 \text{ GeV}$

**Table 2** Summary of event selection.

Process	$\mu\mu H\nu qq$			$\mu\mu Hqq\nu\nu$			$\nu\nu H\mu\mu qq$		
	$\sigma[\text{fb}]$	$\epsilon[\%]$	N	$\sigma[\text{fb}]$	$\epsilon[\%]$	N	$\sigma[\text{fb}]$	$\epsilon[\%]$	N
Signal	?	50.0	40						
ZH									
4F									
2F									
Process	$\nu\nu Hqq\mu\mu$			$qqH\nu\nu\mu\mu$			$qqH\mu\mu\nu\nu$		
	$\sigma[\text{fb}]$	$\epsilon[\%]$	N	$\sigma[\text{fb}]$	$\epsilon[\%]$	N	$\sigma[\text{fb}]$	$\epsilon[\%]$	N
Signal	?	50.0	40						
ZH									
4F									
2F									

could omit it

- Cut conditions are picked-up from the CEPC note. Hope that there is no errors/missing items.