

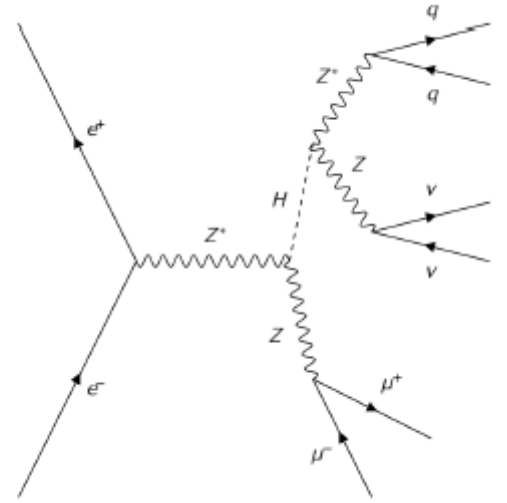
Weekly Updates

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Updates on the draft

- Update Table I.
- Fill contents(numbers) into the Table II.
- Try to make the feynman diagram by a drawing tool



- > have tried from <https://feynman.aivazis.com>
failed to save the diagram with formats (PDF etc.)
- > try via <https://www.aidansean.com/feynman/>
only png file format is available .. => drawing from this tool is temporally used

Tables

- Unification of (neighbouring) value ranges could be done
- Found and fixed wrongly described (by me when took them from the CEPC note) cut values.

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						
$N(jet) = 2$						
Variable	$\mu\mu H\nu\nu qq$	$\nu\nu H\mu\mu qq$	$\nu\nu Hqq\mu\mu$	$qqH\nu\nu\mu\mu$	$qqH\mu\mu\nu\nu$	$\mu\mu Hqq\nu\nu$
$M_{\mu\mu}$ (GeV)	[80, 100]	[60, 100]	[10, 60]	[15, 55]	[75, 100]	[80, 100]
M_{jj} (GeV)	[15, 60]	[10, 55]	[60, 100]	[75, 105]	[75, 110]	[60, 105]
$M_{miss.}$ (GeV)	[75, 105]	[75, 110]	[75, 110]	[70, 110]	[10, 50]	[10, 55]
$M_{\mu\mu}^{recoil}$ (GeV)	[110, 140]	-	[165, 215]	[175, 215]	[115, 155]	[110, 140]
$M_{vis.}$ (GeV)	-	[110, 140]	[110, 140]	[115, 155]	[185, 215]	[175, 215]
M_{jj}^{recoil} (GeV)	[185, 220]	-	-	[110, 140]	[110, 140]	-
N_{PFO}	[20, 90]	[20, 60]	[30, 100]	[40, 95]	[35, 100]	[30, 100]
$ \cos\theta_{vis.} $	< 0.95					
$\Delta\phi_{ZZ}$ (degree)	[60, 170]	< 135	< 130	-	[120, 170]	[120, 170]
$ M_{vis.} - M_H $ (GeV)	> 3	-	-	> 3	-	-
$ M_{jj}^{recoil} - M_H $ (GeV)	-	-	> 3	-	-	> 3
$ M_{\mu\mu}^{recoil} - M_H $ (GeV)	-	> 3	-	-	> 3	-

Table 2 Summary of event selection.

Process	$\mu\mu H\nu\nu qq$		$\nu\nu H\mu\mu qq$		$\nu\nu Hqq\mu\mu$	
	ϵ [%]	$N_{evt.}$	ϵ [%]	$N_{evt.}$	ϵ [%]	$N_{evt.}$
Signal	36	50	51	72	36	50
Higgs decays Bg.	$3.2 \cdot 10^{-3}$	36	$1.5 \cdot 10^{-3}$	17	$1.1 \cdot 10^{-2}$	130
SM four-fermion Bg.	$3.7 \cdot 10^{-6}$	4	$8.4 \cdot 10^{-6}$	9	$4.0 \cdot 10^{-5}$	43
SM two-fermion Bg.	$< 1.2 \cdot 10^{-7}$	0	$< 1.2 \cdot 10^{-7}$	0	$< 1.2 \cdot 10^{-7}$	0
Process	$qqH\nu\nu\mu\mu$		$qqH\mu\mu\nu\nu$		$\mu\mu Hqq\nu\nu$	
	ϵ [%]	$N_{evt.}$	ϵ [%]	$N_{evt.}$	ϵ [%]	$N_{evt.}$
Signal	29	41	28	39	33	46
Higgs decays Bg.	$2.9 \cdot 10^{-2}$	326	$2.4 \cdot 10^{-2}$	275	$6.5 \cdot 10^{-2}$	738
SM four-fermion Bg.	$1.8 \cdot 10^{-4}$	190	$3.2 \cdot 10^{-4}$	345	$6.0 \cdot 10^{-4}$	644
SM two-fermion Bg.	$< 1.2 \cdot 10^{-7}$	0	$< 1.2 \cdot 10^{-7}$	0	$< 1.2 \cdot 10^{-7}$	0