The LaTeX report

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1 Setup

1.1 Command history

```
ma5>
ma5>
ma5>
ma5>!printf "we will define some signal regions.  For more details please seehttps:/-
/twiki.cern.ch/twiki/pub/LHCPhysics/LHCHWGFiducialAndSTXS/simplifiedXS_VH_1_2.pdf"
ma5>define_region NoCuts
ma5>define_region NJ0_0_75
ma5>define_region NJ1_0_75
ma5>define_region NJ2_0_75
ma5>define_region NJ0_75_150
ma5>define_region NJ1_75_150
ma5>define_region NJ2_75_150
ma5>define_region NJ0_150_250
ma5>define_region NJ1_150_250
ma5>define_region NJ2_150_250
ma5>define_region NJ2_250_400
ma5>define_region NJ1_250_400
ma5>define_region NJ0_250_400
ma5>define_region NJ0_400_inf
ma5>define_region NJ1_400_inf
ma5>define_region NJ2_400_inf
ma5>!printf "* Define cutflow.  Syntax:  select <CUT> {<REGION>} "
ma5>select N (j) == 0 {NJ0_0_75 NJ0_75_150 NJ0_150_250 NJ0_250_400 NJ0_400_inf}
ma5>select N (j) == 1 {NJ1_0_75 NJ1_75_150 NJ1_150_250 NJ1_250_400 NJ1_400_inf}
ma5>select N (j) >= 2 {NJ2_0_75 NJ2_75_150 NJ2_150_250 NJ2_250_400 NJ2_400_inf}
ma5>!printf "* l is not defined in parton level so we will define it as l = l+ l-"
ma5>define l = l+ l-
ma5>plot N (j) 10 0 10 {NoCuts} [logY]
ma5>plot N (j) 10 0 10 {NJ1_0_75 NJ1_75_150 NJ1_150_250 NJ1_250_400 NJ1_400_inf} [logY]
ma5>plot N (j) 10 0 10 {NJ2_0_75 NJ2_75_150 NJ2_150_250 NJ2_250_400 NJ2_400_inf} [logY]
ma5>select vPT(l[1] l[2]) > 0 and vPT(l[1] l[2]) <= 75 {NJ0_0_75 NJ1_0_75 NJ2_0_75}
ma5>select vPT (l[1] l[2]) > 75 and vPT (l[1] l[2]) <= 150 {NJ0_75_150 NJ1_75_150 NJ2_75_150}
ma5>select vPT (l[1] l[2]) > 150 and vPT (l[1] l[2]) <= 250 {NJ0_150_250 NJ1_150_250
NJ2_150_250}
ma5>select vPT (l[1] l[2]) > 250 and vPT (l[1] l[2]) <= 400 {NJ2_250_400 NJ1_250_400
NJ0_250_400}
ma5>select vPT (l[1] l[2]) > 400 {NJ0_400_inf NJ1_400_inf NJ2_400_inf}
ma5>!printf "* Define histograms.  Syntax:  plot <OBS> (<PARTICLES>) <NBINS> <XMIN>
<XMAX> {<REGION>} [<OPT>]"
ma5>plot vPT (l[1] l[2]) 50 0 500 {NoCuts} [logY]
ma5>plot vPT (l[1] l[2]) 50 0 500 {NJ0_0_75} [logY]
ma5>plot vPT (l[1] l[2]) 50 0 500 {NJ1_0_75} [logY]
ma5>plot vPT (l[1] l[2]) 50 0 500 {NJ2_0_75} [logY]
ma5>plot vPT (l[1] l[2]) 50 0 500 {NJ0_75_150} [logY]
ma5>plot vPT (l[1] l[2]) 50 0 500 {NJ2_150_250} [logY]
ma5>plot vPT (l[1] l[2]) 50 0 500 {NJ0_250_400} [logY]
```

```
ma5>plot M (l[1] l[2] b[1] b[2]) 50 0 500 {NoCuts} [logY]
ma5>plot M (l[1] l[2] b[1] b[2]) 50 0 500 {NJ2_0_75} [logY]
ma5>plot M (l[1] l[2] b[1] b[2]) 50 0 500 {NJ2_150_250} [logY]
ma5>plot M (l[1] l[2] b[1] b[2]) 50 0 500 {NJ2_250_400} [logY]
ma5>plot M (l[1] l[2] b[1] b[2]) 50 0 500 {NJ2_400_inf} [logY]
ma5>!printf "* Lets define higgs and plot the mass with respect to the generated higgs
boson.  Note that this assumes that you generated 'p p > h l+ l-' if you generated
'p p > b b  l+ l-' instead this will not capture the interstate higgs boson."
ma5>define higgs = 25
ma5>plot M (l[1] l[2] higgs) 50 0 500 {NoCuts} [logY]
ma5>plot M (l[1] l[2] higgs) 50 0 500 {NJ2_0_75} [logY]
ma5>plot M (l[1] l[2] higgs) 50 0 500 {NJ2_150_250} [logY]
ma5>plot M (l[1] l[2] higgs) 50 0 500 {NJ2_250_400} [logY]
ma5>plot M (l[1] l[2] higgs) 50 0 500 {NJ2_400_inf} [logY]
ma5>!printf "you need to import your sample by typingimport /PATH/TO/MY/SAMPLE/MYSAMPLE.lhe.gz
as MY_FANCY_SMP_NAMEthat 'MY_FANCY_SMP_NAME' is a tag which separates your samples,
you can add multiple samples with different tags"
ma5>import pp_hee_SM/Events/run_01/*lhe.gz as SM
ma5>import pp_hee_cHu_int/Events/run_01/*lhe.gz as cHu_int
ma5>import pp_hee_cHB_int/Events/run_01/*lhe.gz as cHB_int
ma5>import pp_hee_cHu_square/Events/run_01/*lhe.gz as cHu_square
ma5>import pp_hee_cHB_square/Events/run_01/*lhe.gz as cHB_square
ma5>import pp_hee_cHu_cHB/Events/run_01/*lhe.gz as cHu_cHB
ma5>import pp_hee_prop/Events/run_01/*lhe.gz as propagator
ma5>submit SMEFT_parton_analysis
```

1.2 Configuration

- MadAnalysis version 1.9.19 (2021/03/24).
- Histograms given for an integrated luminosity of 10fb^{-1}.

2 Datasets

2.1 sm

- Sample consisting of: signal events.
- Generated events: 10000 events.
- Normalization to the luminosity: 129+/- 1 events.
- Ratio (event weight): 0.013 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
pp_hee_SM/Events/run_01/-unweighted_events.lhe.gz	10000	0.0129 @ 0.34%	0.0

2.2 chu_int

- Sample consisting of: signal events.
- Generated events: 10000 events.
- Normalization to the luminosity: 53+/- 1 events.
- Ratio (event weight): 0.0053 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
pp_hee_cHu_int/Events/-run_01/unweighted_events.lhe.gz	10000	0.00538 @ 0.4%	0.0

2.3 chb_int

- Sample consisting of: signal events.
- Generated events: 10000 events.
- Normalization to the luminosity: 10+/- 1 events.
- Ratio (event weight): 0.001 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
pp_hee_cHB_int/Events/-run_01/unweighted_events.lhe.gz	10000	0.00107 @ 0.67%	22

2.4 chu_square

- Sample consisting of: signal events.
- Generated events: 10000 events.
- Normalization to the luminosity: 152+/- 1 events.
- Ratio (event weight): 0.015 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
pp_hee_cHu_square/Events/-run_01/unweighted_events.lhe.gz	10000	0.0153 @ 0.44%	0.0

2.5 chb_square

- Sample consisting of: signal events.
- Generated events: 10000 events.
- Normalization to the luminosity: 4+/- 1 events.
- Ratio (event weight): 0.0004 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
pp_hee_cHB_square/Events/-run_01/unweighted_events.lhe.gz	10000	0.000468 @ 0.39%	0.0

2.6 chu_chb

- Sample consisting of: signal events.
- Generated events: 10000 events.
- Normalization to the luminosity: 24+/- 1 events.
- Ratio (event weight): 0.0024 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
pp_hee_cHu_cHB/Events/-run_01/unweighted_events.lhe.gz	10000	0.00249 @ 0.56%	9.9

2.7 propagator

- Sample consisting of: signal events.
- Generated events: 10000 events.
- Normalization to the luminosity: -1+/- 1 events.
- Ratio (event weight): -0.0001 .

Path to the event file	Nr. of events	Cross section (pb)	Negative wgts (%)
pp_hee_prop/Events/run_01/-unweighted_events.lhe.gz	10000	-0.000192 @ -0.32%	100

3 Histos and cuts

3.1 Cut 1

*** Cut: select N (j) = 0.0**
*** Regions:** NJ0_0_75 , NJ0_75_150 , NJ0_150_250 , NJ0_250_400 , NJ0_400_inf

Region: "NJ0_0_75"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	129.146 +/- 0.435	0.0 +/- 0.0	1.0	1.0
chu_int	53.759 +/- 0.217	0.0 +/- 0.0	1.00e+00 +/- 1.57e-09	1.00e+00 +/- 1.57e-09
chb_int	10.6507 +/- 0.0718	0.0 +/- 0.0	1.00e+00 +/- 3.96e-09	1.00e+00 +/- 3.96e-09
chu_square	152.673 +/- 0.672	0.0 +/- 0.0	1.0	1.0
chb_square	4.6803 +/- 0.0182	0.0 +/- 0.0	1.0	1.0
chu_chb	24.879 +/- 0.139	0.0 +/- 0.0	1.0	1.0
propagator	-1.92 +/- 0.01	0.0 +/- 0.0	1.00e+00 +/- 7.75e-09	1.00e+00 +/- 7.75e-09

Region: "NJ0_75_150"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	129.146 +/- 0.435	0.0 +/- 0.0	1.0	1.0
chu_int	53.759 +/- 0.217	0.0 +/- 0.0	1.00e+00 +/- 1.57e-09	1.00e+00 +/- 1.57e-09
chb_int	10.6507 +/- 0.0718	0.0 +/- 0.0	1.00e+00 +/- 3.96e-09	1.00e+00 +/- 3.96e-09
chu_square	152.673 +/- 0.672	0.0 +/- 0.0	1.0	1.0
chb_square	4.6803 +/- 0.0182	0.0 +/- 0.0	1.0	1.0
chu_chb	24.879 +/- 0.139	0.0 +/- 0.0	1.0	1.0
propagator	-1.92 +/- 0.01	0.0 +/- 0.0	1.00e+00 +/- 7.75e-09	1.00e+00 +/- 7.75e-09

Region: "NJ0_150_250"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	129.146 +/- 0.435	0.0 +/- 0.0	1.0	1.0
chu_int	53.759 +/- 0.217	0.0 +/- 0.0	1.00e+00 +/- 1.57e-09	1.00e+00 +/- 1.57e-09
chb_int	10.6507 +/- 0.0718	0.0 +/- 0.0	1.00e+00 +/- 3.96e-09	1.00e+00 +/- 3.96e-09
chu_square	152.673 +/- 0.672	0.0 +/- 0.0	1.0	1.0
chb_square	4.6803 +/- 0.0182	0.0 +/- 0.0	1.0	1.0
chu_chb	24.879 +/- 0.139	0.0 +/- 0.0	1.0	1.0
propagator	-1.92 +/- 0.01	0.0 +/- 0.0	1.00e+00 +/- 7.75e-09	1.00e+00 +/- 7.75e-09

Region: "NJ0_250_400"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	129.146 +/- 0.435	0.0 +/- 0.0	1.0	1.0
chu_int	53.759 +/- 0.217	0.0 +/- 0.0	1.00e+00 +/- 1.57e-09	1.00e+00 +/- 1.57e-09
chb_int	10.6507 +/- 0.0718	0.0 +/- 0.0	1.00e+00 +/- 3.96e-09	1.00e+00 +/- 3.96e-09
chu_square	152.673 +/- 0.672	0.0 +/- 0.0	1.0	1.0
chb_square	4.6803 +/- 0.0182	0.0 +/- 0.0	1.0	1.0
chu_chb	24.879 +/- 0.139	0.0 +/- 0.0	1.0	1.0
propagator	-1.92 +/- 0.01	0.0 +/- 0.0	1.00e+00 +/- 7.75e-09	1.00e+00 +/- 7.75e-09

Region: "NJ0_400_inf"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	129.146 +/- 0.435	0.0 +/- 0.0	1.0	1.0
chu_int	53.759 +/- 0.217	0.0 +/- 0.0	1.00e+00 +/- 1.57e-09	1.00e+00 +/- 1.57e-09
chb_int	10.6507 +/- 0.0718	0.0 +/- 0.0	1.00e+00 +/- 3.96e-09	1.00e+00 +/- 3.96e-09
chu_square	152.673 +/- 0.672	0.0 +/- 0.0	1.0	1.0
chb_square	4.6803 +/- 0.0182	0.0 +/- 0.0	1.0	1.0
chu_chb	24.879 +/- 0.139	0.0 +/- 0.0	1.0	1.0
propagator	-1.92 +/- 0.01	0.0 +/- 0.0	1.00e+00 +/- 7.75e-09	1.00e+00 +/- 7.75e-09

3.2 Cut 2

*** Cut: select N (j) = 1.0**
*** Regions:** NJ1_0_75 , NJ1_75_150 , NJ1_150_250 , NJ1_250_400 , NJ1_400_inf

Region: "NJ1_0_75"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	129.146 +/- 0.435	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	53.759 +/- 0.217	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	10.6507 +/- 0.0718	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	152.673 +/- 0.672	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	4.6803 +/- 0.0182	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	24.879 +/- 0.139	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	-1.92 +/- 0.01	0.0 +/- 0.0	0.0 +/- 0.0

Region: "NJ1_75_150"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	129.146 +/- 0.435	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	53.759 +/- 0.217	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	10.6507 +/- 0.0718	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	152.673 +/- 0.672	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	4.6803 +/- 0.0182	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	24.879 +/- 0.139	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	-1.92 +/- 0.01	0.0 +/- 0.0	0.0 +/- 0.0

Region: "NJ1_150_250"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	129.146 +/- 0.435	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	53.759 +/- 0.217	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	10.6507 +/- 0.0718	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	152.673 +/- 0.672	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	4.6803 +/- 0.0182	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	24.879 +/- 0.139	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	-1.92 +/- 0.01	0.0 +/- 0.0	0.0 +/- 0.0

Region: "NJ1_250_400"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	129.146 +/- 0.435	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	53.759 +/- 0.217	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	10.6507 +/- 0.0718	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	152.673 +/- 0.672	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	4.6803 +/- 0.0182	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	24.879 +/- 0.139	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	-1.92 +/- 0.01	0.0 +/- 0.0	0.0 +/- 0.0

Region: "NJ1_400_inf"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	129.146 +/- 0.435	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	53.759 +/- 0.217	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	10.6507 +/- 0.0718	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	152.673 +/- 0.672	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	4.6803 +/- 0.0182	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	24.879 +/- 0.139	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	-1.92 +/- 0.01	0.0 +/- 0.0	0.0 +/- 0.0

3.3 Cut 3

*** Cut: select N (j) >= 2.0**
*** Regions:** NJ2_0_75 , NJ2_75_150 , NJ2_150_250 , NJ2_250_400 , NJ2_400_inf

Region: "NJ2_0_75"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	129.146 +/- 0.435	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	53.759 +/- 0.217	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	10.6507 +/- 0.0718	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	152.673 +/- 0.672	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	4.6803 +/- 0.0182	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	24.879 +/- 0.139	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	-1.92 +/- 0.01	0.0 +/- 0.0	0.0 +/- 0.0

Region: "NJ2_75_150"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	129.146 +/- 0.435	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	53.759 +/- 0.217	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	10.6507 +/- 0.0718	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	152.673 +/- 0.672	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	4.6803 +/- 0.0182	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	24.879 +/- 0.139	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	-1.92 +/- 0.01	0.0 +/- 0.0	0.0 +/- 0.0

Region: "NJ2_150_250"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	129.146 +/- 0.435	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	53.759 +/- 0.217	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	10.6507 +/- 0.0718	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	152.673 +/- 0.672	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	4.6803 +/- 0.0182	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	24.879 +/- 0.139	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	-1.92 +/- 0.01	0.0 +/- 0.0	0.0 +/- 0.0

Region: "NJ2_250_400"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	129.146 +/- 0.435	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	53.759 +/- 0.217	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	10.6507 +/- 0.0718	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	152.673 +/- 0.672	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	4.6803 +/- 0.0182	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	24.879 +/- 0.139	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	-1.92 +/- 0.01	0.0 +/- 0.0	0.0 +/- 0.0

Region: "NJ2_400_inf"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	129.146 +/- 0.435	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	53.759 +/- 0.217	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	10.6507 +/- 0.0718	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	152.673 +/- 0.672	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	4.6803 +/- 0.0182	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	24.879 +/- 0.139	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	-1.92 +/- 0.01	0.0 +/- 0.0	0.0 +/- 0.0

3.4 Histogram 1

*** Plot: N (j)**
*** Regions:** NoCuts

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	129	1.0	0.0	0.0	0.0	0.0
chu_int	53.8	1.0	0.0	0.0	0.0	0.0
chb_int	10.7	1.0	0.0	0.0	0.0	0.0
chu_square	152	1.0	0.0	0.0	0.0	0.0
chb_square	4.68	1.0	0.0	0.0	0.0	0.0
chu_chb	24.9	1.0	0.0	0.0	0.0	0.0
propagator	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

Warnings related to negative event-weights:
dataset=propagator -> bin 0 has a negative content : -1.923498. This value is set to zero

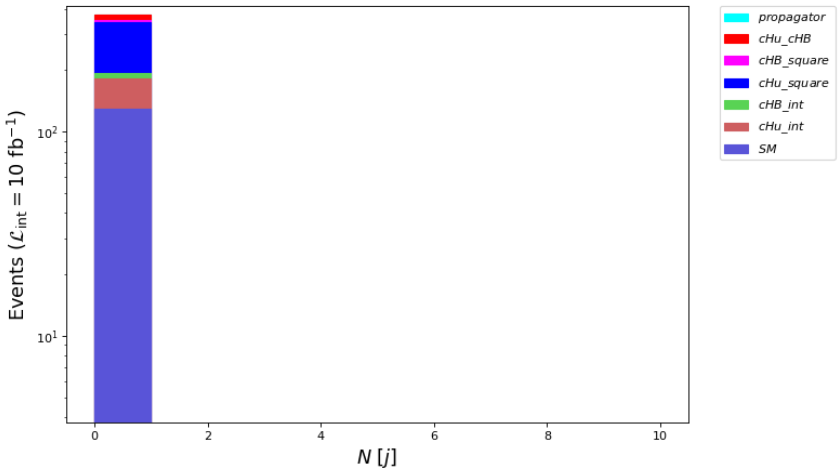


Figure 1.

3.5 Histogram 2

*** Plot: N (j)**
*** Regions:** NJ1_0_75 , NJ1_75_150 , NJ1_150_250 , NJ1_250_400 , NJ1_400_inf

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_chb	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
propagator	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0

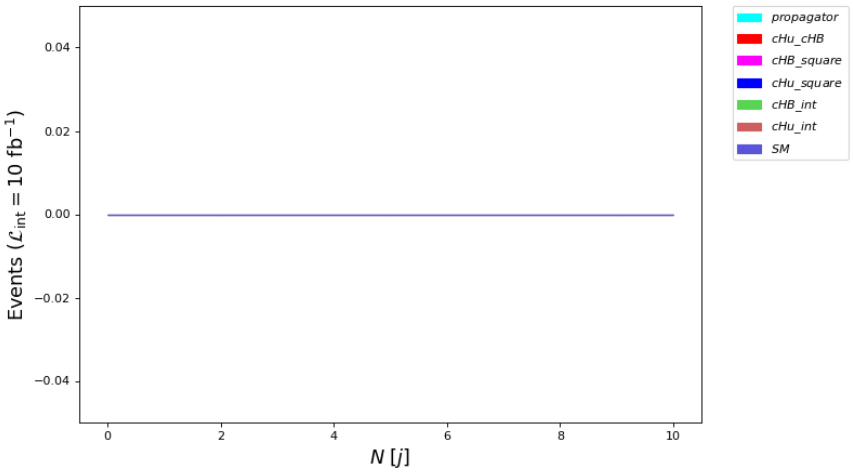


Figure 2.

3.6 Histogram 3

*** Plot: N (j)**
*** Regions:** NJ2_0_75 , NJ2_75_150 , NJ2_150_250 , NJ2_250_400 , NJ2_400_inf

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_chb	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
propagator	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0

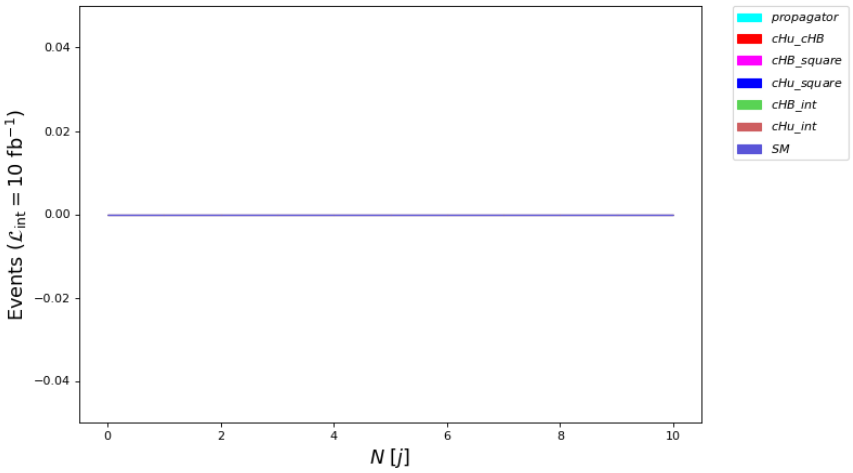


Figure 3.

3.7 Cut 4

*** Cut: select 0.0 > PT <= 75.0**
*** Regions:** NJ0_0_75 , NJ1_0_75 , NJ2_0_75

Region: "NJ0_0_75"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	65.22 +/- 5.69	63.93 +/- 5.69	0.505 +/- 0.044	0.505 +/- 0.044
chu_int	15.03 +/- 3.29	38.73 +/- 3.29	0.2796 +/- 0.0612	0.2796 +/- 0.0612
chb_int	4.43 +/- 1.61	6.23 +/- 1.61	0.415 +/- 0.151	0.415 +/- 0.151
chu_square	14.3 +/- 3.6	138.41 +/- 3.65	0.0934 +/- 0.0236	0.0934 +/- 0.0236
chb_square	1.203 +/- 0.945	3.477 +/- 0.945	0.257 +/- 0.202	0.257 +/- 0.202
chu_chb	4.83 +/- 1.97	20.05 +/- 1.98	0.1941 +/- 0.0793	0.1941 +/- 0.0793
propagator	-1.0 +/- 0.7	-0.922 +/- 0.693	0.52 +/- 0.36	0.52 +/- 0.36

Region: "NJ1_0_75"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0

Region: "NJ2_0_75"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0

3.8 Cut 5

*** Cut: select 75.0 > PT <= 150.0**
*** Regions:** NJ0_75_150 , NJ1_75_150 , NJ2_75_150

Region: "NJ0_75_150"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	45.16 +/- 5.42	83.98 +/- 5.43	0.350 +/- 0.042	0.350 +/- 0.042
chu_int	17.65 +/- 3.44	36.11 +/- 3.45	0.328 +/- 0.064	0.328 +/- 0.064
chb_int	3.89 +/- 1.57	6.76 +/- 1.57	0.365 +/- 0.148	0.365 +/- 0.148
chu_square	26.63 +/- 4.69	126.05 +/- 4.72	0.1744 +/- 0.0307	0.1744 +/- 0.0307
chb_square	1.56 +/- 1.02	3.12 +/- 1.02	0.332 +/- 0.218	0.332 +/- 0.218
chu_chb	7.04 +/- 2.25	17.84 +/- 2.25	0.2829 +/- 0.0903	0.2829 +/- 0.0903
propagator	-0.645 +/- 0.655	-1.28 +/- 0.65	0.335 +/- 0.340	0.335 +/- 0.340

Region: "NJ1_75_150"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0

Region: "NJ2_75_150"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0

3.9 Cut 6

*** Cut: select 150.0 > PT <= 250.0**
*** Regions:** NJ0_150_250 , NJ1_150_250 , NJ2_150_250

Region: "NJ0_150_250"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	14.36 +/- 3.57	114.78 +/- 3.59	0.1112 +/- 0.0277	0.1112 +/- 0.0277
chu_int	12.33 +/- 3.08	41.43 +/- 3.09	0.2293 +/- 0.0573	0.2293 +/- 0.0573
chb_int	1.65 +/- 1.18	9.00 +/- 1.18	0.155 +/- 0.111	0.155 +/- 0.111
chu_square	37.59 +/- 5.33	115.09 +/- 5.35	0.2462 +/- 0.0349	0.2462 +/- 0.0349
chb_square	1.070 +/- 0.909	3.610 +/- 0.909	0.229 +/- 0.194	0.229 +/- 0.194
chu_chb	6.01 +/- 2.14	18.87 +/- 2.14	0.2417 +/- 0.0858	0.2417 +/- 0.0858
propagator	-0.222 +/- 0.443	-1.7 +/- 0.4	0.115 +/- 0.230	0.115 +/- 0.230

Region: "NJ1_150_250"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0

Region: "NJ2_150_250"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0

3.10 Cut 7

*** Cut: select 250.0 > PT <= 400.0**
*** Regions:** NJ2_250_400 , NJ1_250_400 , NJ0_250_400

Region: "NJ2_250_400"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0

Region: "NJ1_250_400"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0

Region: "NJ0_250_400"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	3.85 +/- 1.93	125.30 +/- 1.98	0.030 +/- 0.015	0.030 +/- 0.015
chu_int	6.93 +/- 2.46	46.83 +/- 2.46	0.1289 +/- 0.0457	0.1289 +/- 0.0457
chb_int	0.573 +/- 0.736	10.078 +/- 0.739	0.0538 +/- 0.0691	0.0538 +/- 0.0691
chu_square	46.7 +/- 5.7	105.94 +/- 5.71	0.3061 +/- 0.0373	0.3061 +/- 0.0373
chb_square	0.598 +/- 0.722	4.083 +/- 0.722	0.128 +/- 0.154	0.128 +/- 0.154
chu_chb	4.89 +/- 1.98	19.99 +/- 1.99	0.1967 +/- 0.0797	0.1967 +/- 0.0797
propagator	-0.0489 +/- 0.2182	-1.87 +/- 0.22	0.0254 +/- 0.1134	0.0254 +/- 0.1134

3.11 Cut 8

*** Cut: select PT (l[1] l[2]) > 400.0**
*** Regions:** NJ0_400_inf , NJ1_400_inf , NJ2_400_inf

Region: "NJ0_400_inf"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.555 +/- 0.744	128.590 +/- 0.861	0.0043 +/- 0.0058	0.0043 +/- 0.0058
chu_int	1.82 +/- 1.33	51.94 +/- 1.34	0.0339 +/- 0.0247	0.0339 +/- 0.0247
chb_int	0.117 +/- 0.340	10.534 +/- 0.348	0.011 +/- 0.032	0.011 +/- 0.032
chu_square	27.47 +/- 4.75	125.21 +/- 4.78	0.1799 +/- 0.0311	0.1799 +/- 0.0311
chb_square	0.254 +/- 0.490	4.43 +/- 0.49	0.0542 +/- 0.1047	0.0542 +/- 0.1047
chu_chb	2.10 +/- 1.39	22.77 +/- 1.39	0.0846 +/- 0.0558	0.0846 +/- 0.0558
propagator	-0.00673 +/- 0.08191	-1.92 +/- 0.08	0.0035 +/- 0.0426	0.0035 +/- 0.0426

Region: "NJ1_400_inf"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0

Region: "NJ2_400_inf"				
Dataset	Events kept: K	Rejected events: R	Efficiency: K / (K + R)	Cumul. efficiency: K / Initial
sm	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_int	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chb_square	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
chu_chb	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0
propagator	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0	0.0 +/- 0.0

3.12 Histogram 4

*** Plot: PT (l[1] l[2])**
*** Regions:** NoCuts

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	129	1.0	90.7539	67.63	0.0	0.05
chu_int	53.8	1.0	149.495	106.4	0.0	0.56
chb_int	10.7	1.0	92.073	68.07	0.0	0.1442
chu_square	152	1.0	261.639	151.5	0.0	5.63
chb_square	4.68	1.0	161.825	132.9	0.0	2.37
chu_chb	24.9	1.0	167.604	122.0	0.0	1.584
propagator	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

Warnings related to negative event-weights:
dataset=chb_int -> bin 38 has a negative content : -0.001929580000000002. This value is set to zero
dataset=chb_int -> bin 41 has a negative content : -0.005788740000000002. This value is set to zero
dataset=chb_int -> bin 45 has a negative content : -0.0019295799999999998. This value is set to zero
dataset=chb_int -> bin 46 has a negative content : -0.0019295799999999998. This value is set to zero
dataset=propagator -> bin 0 has a negative content : -0.03443062. This value is set to zero
dataset=propagator -> bin 1 has a negative content : -0.09078913. This value is set to zero
dataset=propagator -> bin 2 has a negative content : -0.1336831. This value is set to zero
dataset=propagator -> bin 3 has a negative content : -0.1534952. This value is set to zero
dataset=propagator -> bin 4 has a negative content : -0.1771542. This value is set to zero
dataset=propagator -> bin 5 has a negative content : -0.1796548. This value is set to zero
dataset=propagator -> bin 6 has a negative content : -0.1596504. This value is set to zero
dataset=propagator -> bin 7 has a negative content : -0.1377225. This value is set to zero
dataset=propagator -> bin 8 has a negative content : -0.1250274. This value is set to zero
dataset=propagator -> bin 9 has a negative content : -0.1096394. This value is set to zero
dataset=propagator -> bin 10 has a negative content : -0.09771372. This value is set to zero
dataset=propagator -> bin 11 has a negative content : -0.07790169. This value is set to zero
dataset=propagator -> bin 12 has a negative content : -0.06232135. This value is set to zero
dataset=propagator -> bin 13 has a negative content : -0.0578973. This value is set to zero
dataset=propagator -> bin 14 has a negative content : -0.04885686. This value is set to zero
dataset=propagator -> bin 15 has a negative content : -0.03789292. This value is set to zero
dataset=propagator -> bin 16 has a negative content : -0.03212242. This value is set to zero
dataset=propagator -> bin 17 has a negative content : -0.03366122. This value is set to zero
dataset=propagator -> bin 18 has a negative content : -0.02673663. This value is set to zero
dataset=propagator -> bin 19 has a negative content : -0.02154318. This value is set to zero
dataset=propagator -> bin 20 has a negative content : -0.01711914. This value is set to zero
dataset=propagator -> bin 21 has a negative content : -0.01865794. This value is set to zero
dataset=propagator -> bin 22 has a negative content : -0.01442624. This value is set to zero
dataset=propagator -> bin 23 has a negative content : -0.01000219. This value is set to zero
dataset=propagator -> bin 24 has a negative content : -0.009809842. This value is set to zero
dataset=propagator -> bin 25 has a negative content : -0.009425143. This value is set to zero
dataset=propagator -> bin 26 has a negative content : -0.005770495. This value is set to zero
dataset=propagator -> bin 27 has a negative content : -0.005193446. This value is set to zero
dataset=propagator -> bin 28 has a negative content : -0.004039347. This value is set to zero
dataset=propagator -> bin 29 has a negative content : -0.003846997. This value is set to

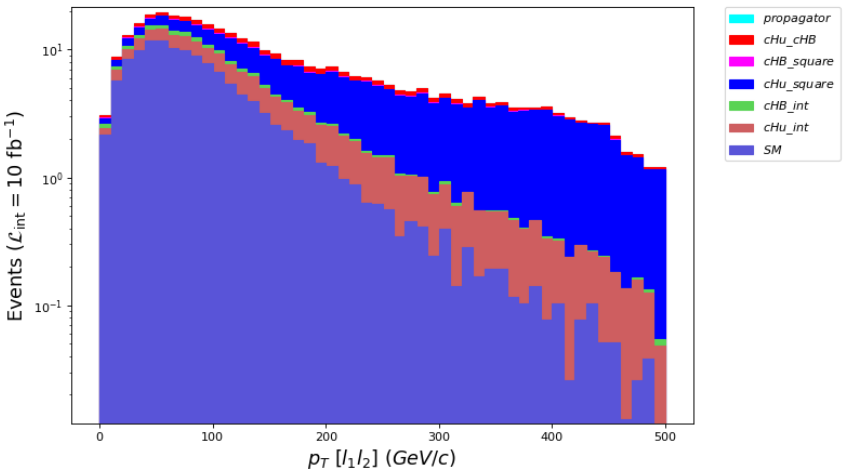

propagator
cHu_cHB
cHB_square
cHu_square
cHB_int
cHu_int
SM
Events ($\mathcal{L}_{\text{int}} = 10\ \text{fb}^{-1}$)
10^1
10^0
10^{-1}
0
100
200
300
400
500
$p_T\ [l_1 l_2]\ (GeV/c)$

Figure 4.

3.13 Histogram 5

*** Plot: PT (l[1] l[2])**
*** Regions:** NJ0_0_75

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	65.2	1.0	44.1772	18.39	0.0	0.0
chu_int	15.0	1.0	46.6458	18.03	0.0	0.0
chb_int	4.43	1.0	44.5167	18.48	0.0	0.0
chu_square	14.3	1.0	48.2378	18.21	0.0	0.0
chb_square	1.2	1.0	47.1969	18.12	0.0	0.0
chu_chb	4.83	1.0	47.168	18.05	0.0	0.0
propagator	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

Warnings related to negative event-weights:
dataset=propagator -> bin 0 has a negative content : -0.03443062. This value is set to zero
dataset=propagator -> bin 1 has a negative content : -0.09078913. This value is set to zero
dataset=propagator -> bin 2 has a negative content : -0.1336831. This value is set to zero
dataset=propagator -> bin 3 has a negative content : -0.1534952. This value is set to zero
dataset=propagator -> bin 4 has a negative content : -0.1771542. This value is set to zero
dataset=propagator -> bin 5 has a negative content : -0.1796548. This value is set to zero
dataset=propagator -> bin 6 has a negative content : -0.1596504. This value is set to zero
dataset=propagator -> bin 7 has a negative content : -0.07232354. This value is set to zero

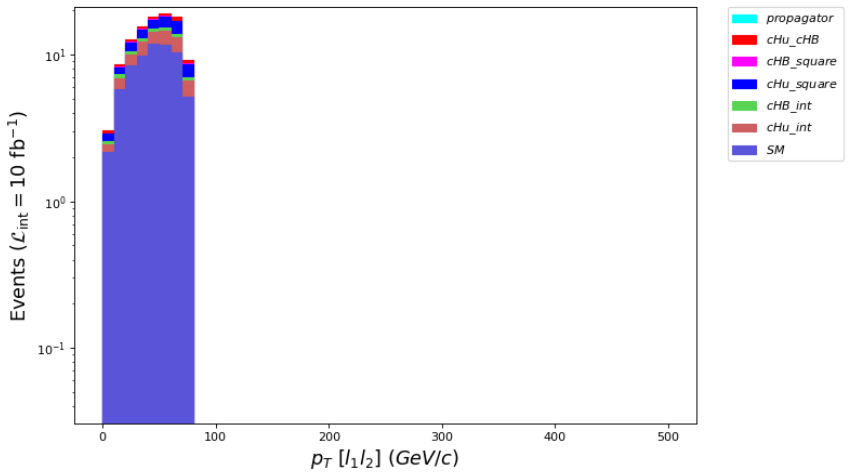


Figure 5.

3.14 Histogram 6

*** Plot: PT (l[1] l[2])**
*** Regions:** NJ1_0_75

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_chb	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
propagator	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0

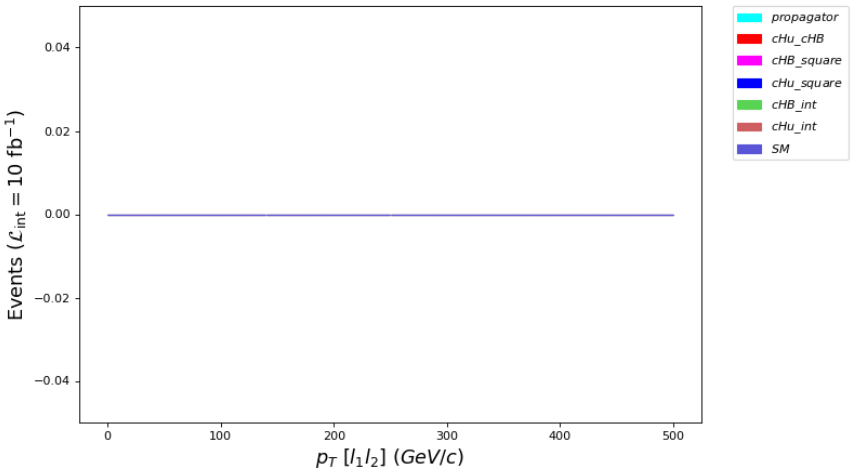


Figure 6.

3.15 Histogram 7

*** Plot: PT (l[1] l[2])**
*** Regions:** NJ2_0_75

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_chb	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
propagator	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0

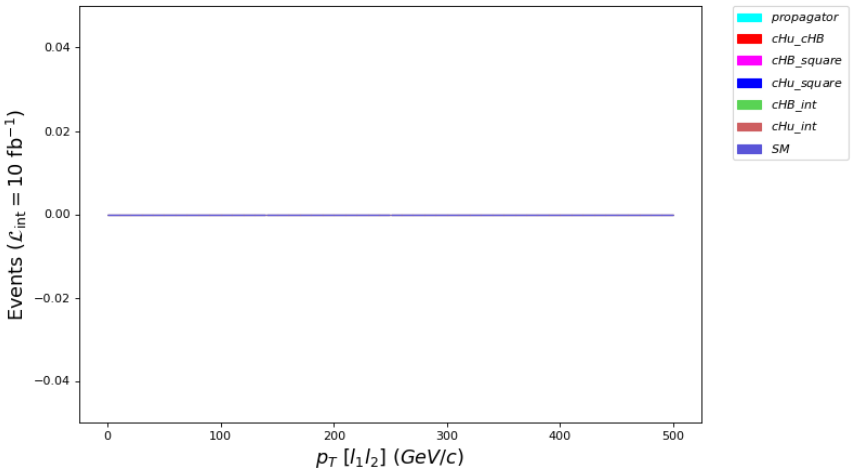


Figure 7.

3.16 Histogram 8

*** Plot: PT (l[1] l[2])**
*** Regions:** NJ0_75_150

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	45.2	1.0	104.84	20.63	0.0	0.0
chu_int	17.6	1.0	110.257	21.22	0.0	0.0
chb_int	3.89	1.0	104.699	20.45	0.0	0.0
chu_square	26.6	1.0	114.092	21.02	0.0	0.0
chb_square	1.56	1.0	109.851	21.44	0.0	0.0
chu_chb	7.04	1.0	109.995	21.54	0.0	0.0
propagator	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

Warnings related to negative event-weights:
dataset=propagator -> bin 7 has a negative content : -0.06539895. This value is set to zero
dataset=propagator -> bin 8 has a negative content : -0.1250274. This value is set to zero
dataset=propagator -> bin 9 has a negative content : -0.1096394. This value is set to zero
dataset=propagator -> bin 10 has a negative content : -0.09771372. This value is set to zero
dataset=propagator -> bin 11 has a negative content : -0.07790169. This value is set to zero
dataset=propagator -> bin 12 has a negative content : -0.06232135. This value is set to zero
dataset=propagator -> bin 13 has a negative content : -0.0578973. This value is set to zero
dataset=propagator -> bin 14 has a negative content : -0.04885686. This value is set to zero

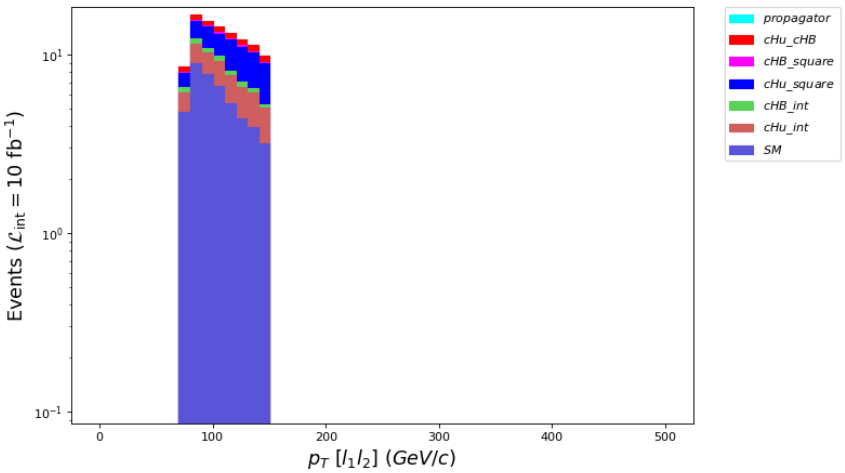

propagator
cHu_cHB
cHB_square
cHu_square
cHB_int
cHu_int
SM
Events ($\mathcal{L}_{\text{int}} = 10\ \text{fb}^{-1}$)
10^{1}
10^{0}
10^{-1}
0
100
200
300
400
500
$p_T\ [l_1 l_2]\ (GeV/c)$

Figure 8.

3.17 Histogram 9

*** Plot: PT (l[1] l[2])**
*** Regions:** NJ2_150_250

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_chb	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
propagator	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0

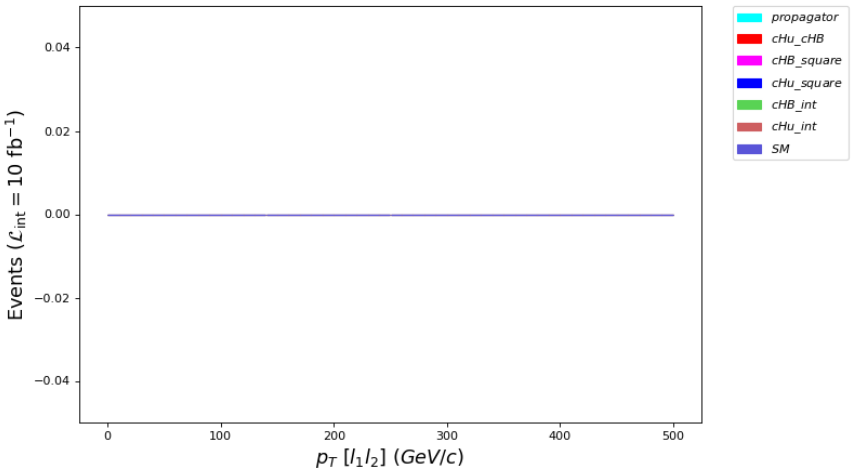


Figure 9.

3.18 Histogram 10

*** Plot: PT (l[1] l[2])**
*** Regions:** NJ0_250_400

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	3.85	1.0	303.882	40.07	0.0	0.0
chu_int	6.93	1.0	311.249	42.83	0.0	0.0
chb_int	0.577	1.0	295.509	35.86	0.0	0.0
chu_square	46.7	1.0	322.998	43.41	0.0	0.0
chb_square	0.598	1.0	311.055	41.65	0.0	0.0
chu_chb	4.89	1.0	311.772	41.03	0.0	0.0
propagator	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

Warnings related to negative event-weights:
dataset=chb_int -> bin 38 has a negative content : -0.001929580000000002. This value is set to zero
dataset=propagator -> bin 25 has a negative content : -0.009425143. This value is set to zero
dataset=propagator -> bin 26 has a negative content : -0.005770495. This value is set to zero
dataset=propagator -> bin 27 has a negative content : -0.005193446. This value is set to zero
dataset=propagator -> bin 28 has a negative content : -0.004039347. This value is set to zero
dataset=propagator -> bin 29 has a negative content : -0.003846997. This value is set to zero
dataset=propagator -> bin 30 has a negative content : -0.002885248. This value is set to zero
dataset=propagator -> bin 31 has a negative content : -0.002692898. This value is set to zero
dataset=propagator -> bin 32 has a negative content : -0.003077598. This value is set to zero
dataset=propagator -> bin 33 has a negative content : -0.002308198. This value is set to zero
dataset=propagator -> bin 34 has a negative content : -0.002500548. This value is set to zero
dataset=propagator -> bin 35 has a negative content : -0.001346449. This value is set to zero
dataset=propagator -> bin 36 has a negative content : -0.001923498. This value is set to zero
dataset=propagator -> bin 37 has a negative content : -0.001346449. This value is set to zero
dataset=propagator -> bin 38 has a negative content : -0.001538799. This value is set to zero
dataset=propagator -> bin 39 has a negative content : -0.0009617492. This value is set to zero

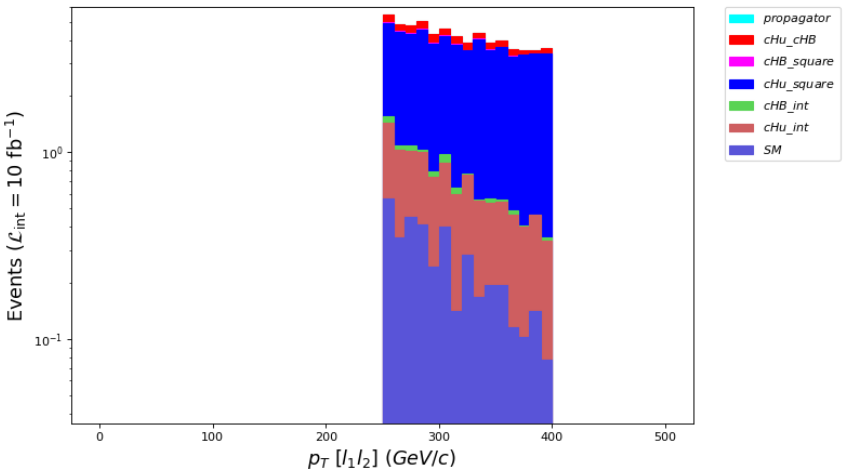

propagator
cHu_cHB
cHB_square
cHu_square
cHB_int
cHu_int
SM
Events ($\mathcal{L}_{\text{int}} = 10\ \text{fb}^{-1}$)
10^0
10^{-1}
0
100
200
300
400
500
$p_T\ [l_1 l_2]\ (GeV/c)$

Figure 10.

3.19 Histogram 11

*** Plot: M (b[1] b[2] l[1] l[2])**
*** Regions:** NoCuts

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_chb	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
propagator	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0

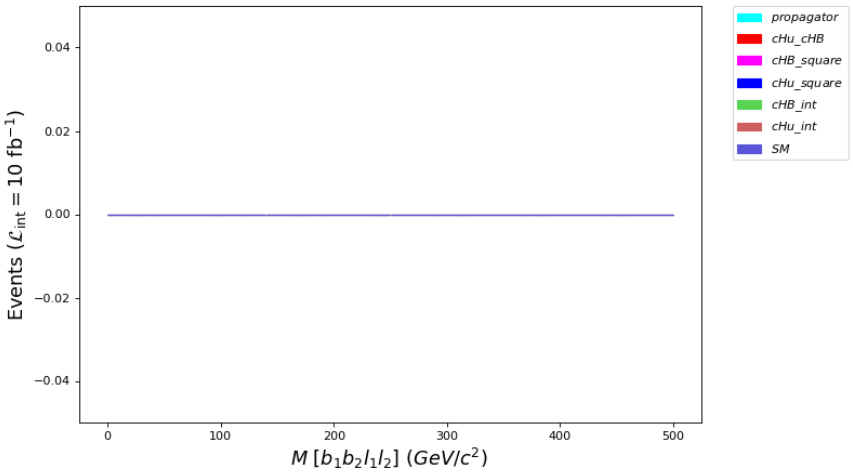


Figure 11.

3.20 Histogram 12

*** Plot: M (b[1] b[2] l[1] l[2])**
*** Regions:** NJ2_0_75

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_chb	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
propagator	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0

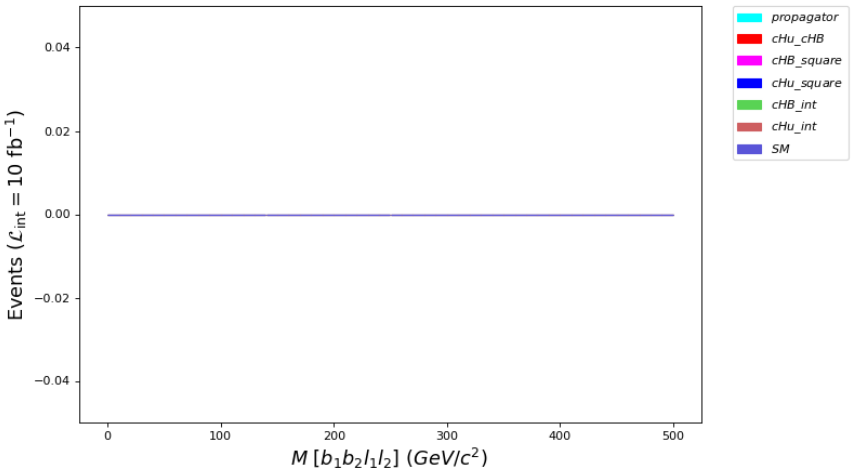


Figure 12.

3.21 Histogram 13

*** Plot: M (b[1] b[2] l[1] l[2])**
*** Regions:** NJ2_150_250

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_chb	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
propagator	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0

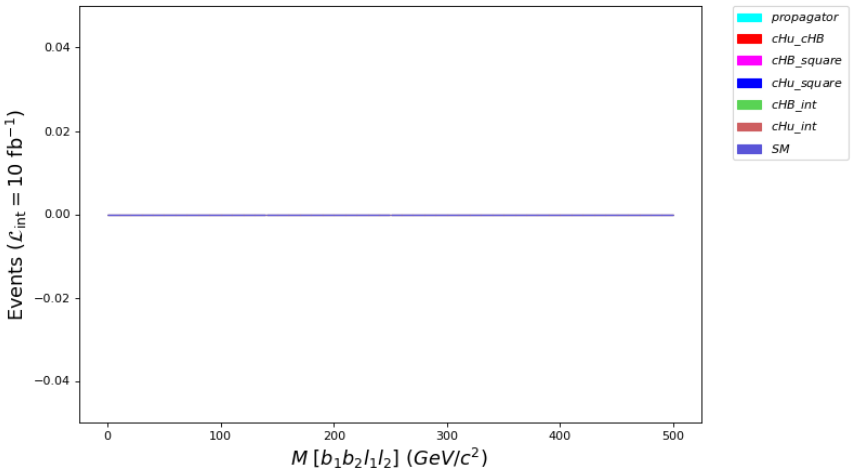


Figure 13.

3.22 Histogram 14

*** Plot: M (b[1] b[2] l[1] l[2])**
*** Regions:** NJ2_250_400

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_chb	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
propagator	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0

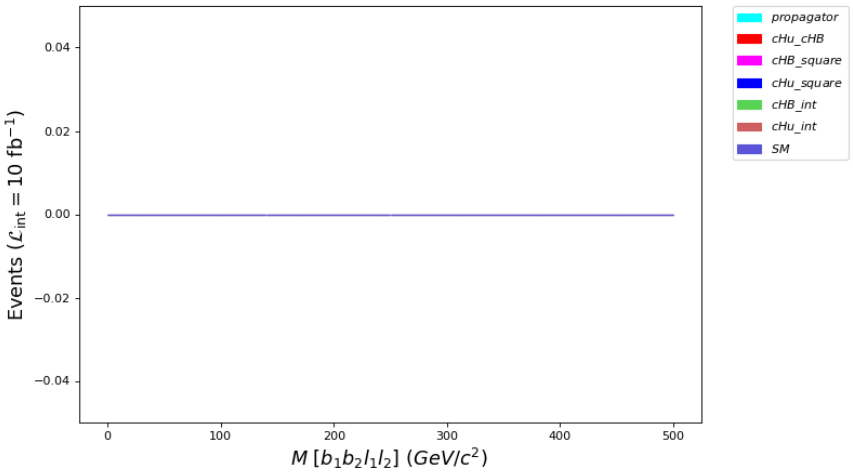


Figure 14.

3.23 Histogram 15

*** Plot: M (b[1] b[2] l[1] l[2])**
*** Regions:** NJ2_400_inf

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_chb	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
propagator	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0

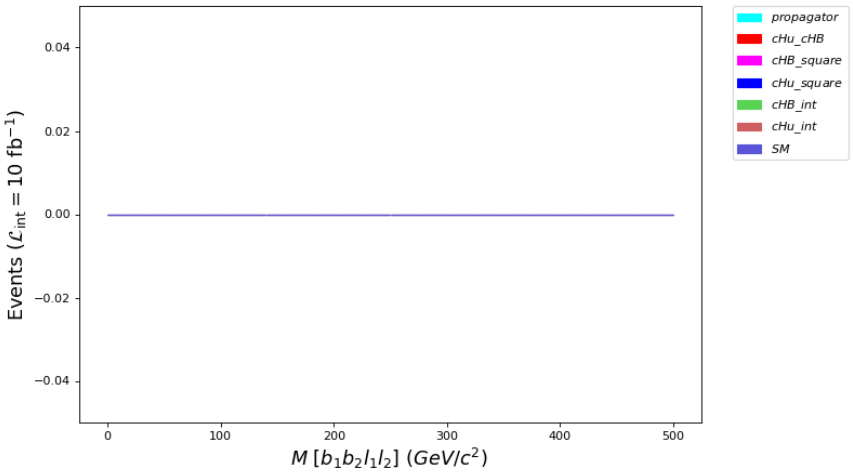


Figure 15.

3.24 Histogram 16

*** Plot: M (higgs l[1] l[2])**
*** Regions:** NoCuts

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	129	1.0	319.016	113.7	0.0	6.72
chu_int	53.8	1.0	430.153	206.5	0.0	26.78
chb_int	10.7	1.0	331.012	129.5	0.0	7.96
chu_square	152	1.0	672.234	340.6	0.0	63.2
chb_square	4.68	1.0	511.594	315.3	0.0	36.45
chu_chb	24.9	1.0	491.124	272.3	0.0	35.41
propagator	0.0 +/- 0.0	1.0	0.0	0.0	0.0	0.0

Warnings related to negative event-weights:
dataset=chu_chb -> bin 16 has a negative content : -0.00313822. This value is set to zero
dataset=chu_chb -> bin 17 has a negative content : -0.00627644. This value is set to zero
dataset=propagator -> bin 21 has a negative content : -0.02654428. This value is set to zero
dataset=propagator -> bin 22 has a negative content : -0.1590733. This value is set to zero
dataset=propagator -> bin 23 has a negative content : -0.1852329. This value is set to zero
dataset=propagator -> bin 24 has a negative content : -0.1615739. This value is set to zero
dataset=propagator -> bin 25 has a negative content : -0.1563804. This value is set to zero
dataset=propagator -> bin 26 has a negative content : -0.1369531. This value is set to zero
dataset=propagator -> bin 27 has a negative content : -0.119834. This value is set to zero
dataset=propagator -> bin 28 has a negative content : -0.1027148. This value is set to zero
dataset=propagator -> bin 29 has a negative content : -0.09790607. This value is set to zero
dataset=propagator -> bin 30 has a negative content : -0.07655524. This value is set to zero
dataset=propagator -> bin 31 has a negative content : -0.0675148. This value is set to zero
dataset=propagator -> bin 32 has a negative content : -0.06347545. This value is set to zero
dataset=propagator -> bin 33 has a negative content : -0.05462736. This value is set to zero
dataset=propagator -> bin 34 has a negative content : -0.04981861. This value is set to zero
dataset=propagator -> bin 35 has a negative content : -0.04654866. This value is set to zero
dataset=propagator -> bin 36 has a negative content : -0.03789292. This value is set to zero
dataset=propagator -> bin 37 has a negative content : -0.03673882. This value is set to zero
dataset=propagator -> bin 38 has a negative content : -0.02827543. This value is set to zero
dataset=propagator -> bin 39 has a negative content : -0.02769838. This value is set to zero
dataset=propagator -> bin 40 has a negative content : -0.02462078. This value is set to zero
dataset=propagator -> bin 41 has a negative content : -0.02173553. This value is set to zero
dataset=propagator -> bin 42 has a negative content : -0.02231258. This value is set to zero
dataset=propagator -> bin 43 has a negative content : -0.01865794. This value is set to zero
dataset=propagator -> bin 44 has a negative content : -0.01288744. This value is set to zero
dataset=propagator -> bin 45 has a negative content : -0.01384919. This value is set to zero
dataset=propagator -> bin 46 has a negative content : -0.01327214. This value is set to zero
dataset=propagator -> bin 47 has a negative content : -0.01384919. This value is set to zero
dataset=propagator -> bin 48 has a negative content : -0.01269509. This value is set to zero
dataset=propagator -> bin 49 has a negative content : -0.01000219. This value is set to zero

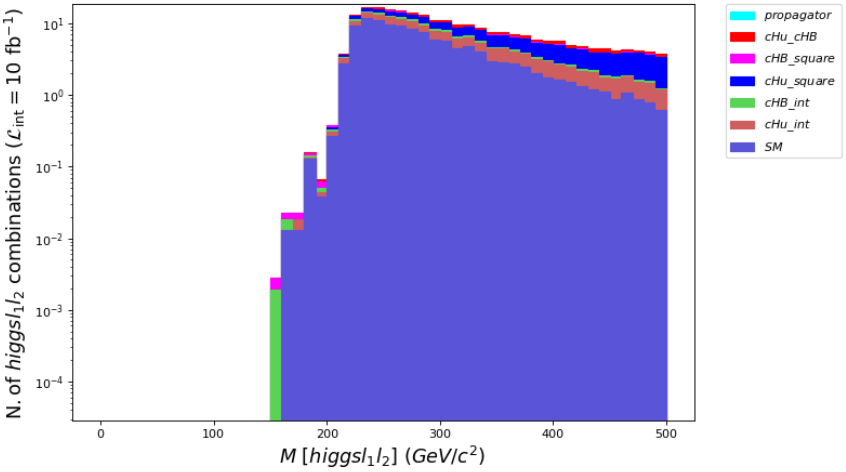

propagator
cHu_cHB
cHB_square
cHu_square
cHB_int
cHu_int
SM
N. of higgsl$_1$l$_2$ combinations ($\mathcal{L}_{int}$ = 10 fb^{-1})
M [higgsl$_1$l$_2$] (GeV/c^2)

Figure 16.

3.25 Histogram 17

*** Plot: M (higgs l[1] l[2])**
*** Regions:** NJ2_0_75

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_chb	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
propagator	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0

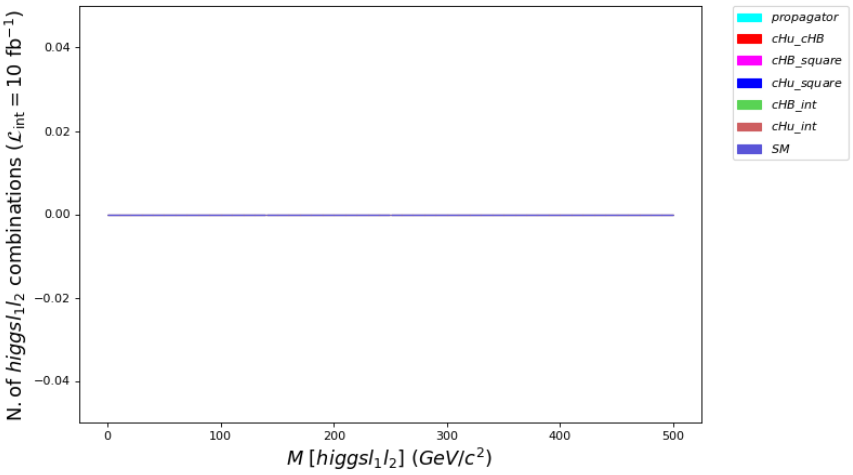


Figure 17.

3.26 Histogram 18

*** Plot: M (higgs l[1] l[2])**
*** Regions:** NJ2_150_250

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_chb	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
propagator	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0

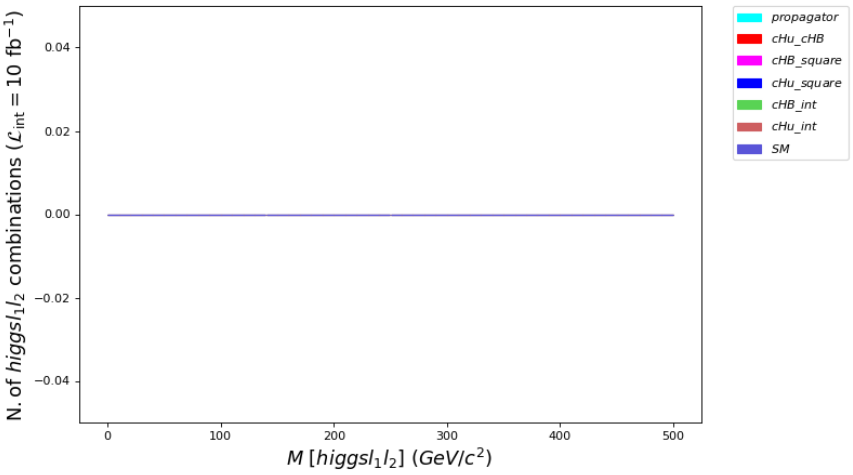


Figure 18.

3.27 Histogram 19

*** Plot: M (higgs l[1] l[2])**
*** Regions:** NJ2_250_400

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_chb	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
propagator	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0

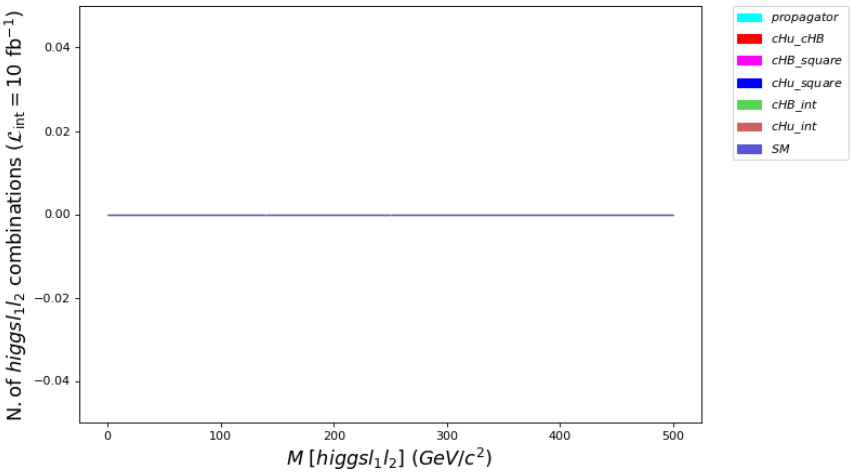


Figure 19.

3.28 Histogram 20

*** Plot: M (higgs l[1] l[2])**
*** Regions:** NJ2_400_inf

Dataset	Integral	Entries per event	Mean	RMS	% underflow	% overflow
sm	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_int	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chb_square	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
chu_chb	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0
propagator	0.0 +/- 0.0	0.	0.0	0.0	0.0	0.0

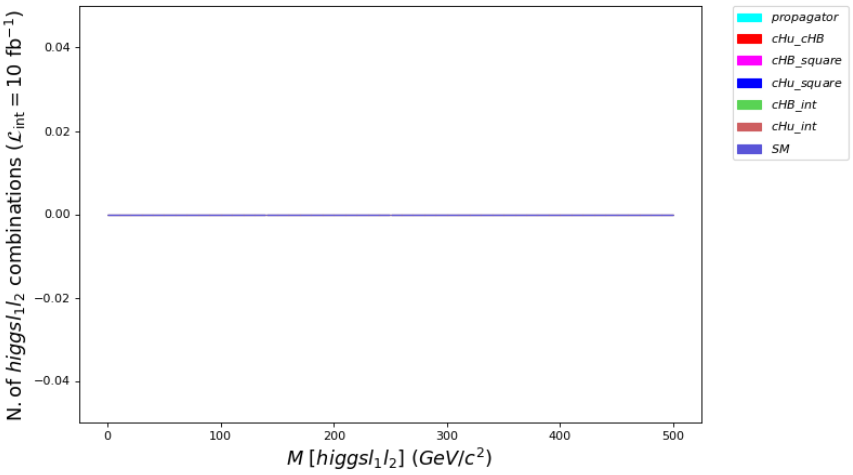


Figure 20.

4 Summary

4.1 Cut-flow charts

- How to compare signal (S) and background (B): S/sqrt(S+B) .
- Object definition selections are indicated in cyan.
- Reject and select are indicated by 'REJ' and 'SEL' respectively

Region: "NoCuts"			
Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	373.865 +/- 0.844		

Region: "NJ0_0_75"			
Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	373.865 +/- 0.844		
SEL: N (j) = 0.0	373.865 +/- 0.844		
SEL: 0.0 > PT <= 75.0	104.0 +/- 8.0		

Region: "NJ1_0_75"			
Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	373.865 +/- 0.844		
SEL: N (j) = 1.0	0.0 +/- 0.0		
SEL: 0.0 > PT <= 75.0	0.0 +/- 0.0		

Region: "NJ2_0_75"			
Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	373.865 +/- 0.844		
SEL: N (j) >= 2.0	0.0 +/- 0.0		
SEL: 0.0 > PT <= 75.0	0.0 +/- 0.0		

Region: "NJ0_75_150"			
Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	373.865 +/- 0.844		
SEL: N (j) = 0.0	373.865 +/- 0.844		
SEL: 75.0 > PT <= 150.0	101.3 +/- 8.5		

Region: "NJ1_75_150"			
Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	373.865 +/- 0.844		
SEL: N (j) = 1.0	0.0 +/- 0.0		
SEL: 75.0 > PT <= 150.0	0.0 +/- 0.0		

Region: "NJ2_75_150"			
Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	373.865 +/- 0.844		
SEL: N (j) >= 2.0	0.0 +/- 0.0		
SEL: 75.0 > PT <= 150.0	0.0 +/- 0.0		

Region: "NJ0_150_250"			
Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	373.865 +/- 0.844		
SEL: N (j) = 0.0	373.865 +/- 0.844		
SEL: 150.0 > PT <= 250.0	72.79 +/- 7.59		

Region: "NJ1_150_250"			
Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	373.865 +/- 0.844		
SEL: N (j) = 1.0	0.0 +/- 0.0		
SEL: 150.0 > PT <= 250.0	0.0 +/- 0.0		

Region: "NJ2_150_250"			
Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	373.865 +/- 0.844		
SEL: N (j) >= 2.0	0.0 +/- 0.0		
SEL: 150.0 > PT <= 250.0	0.0 +/- 0.0		

Region: "NJ2_250_400"			
Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	373.865 +/- 0.844		
SEL: N (j) >= 2.0	0.0 +/- 0.0		
SEL: 250.0 > PT <= 400.0	0.0 +/- 0.0		

Region: "NJ1_250_400"			
Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	373.865 +/- 0.844		
SEL: N (j) = 1.0	0.0 +/- 0.0		
SEL: 250.0 > PT <= 400.0	0.0 +/- 0.0		

Region: "NJ0_250_400"			
Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	373.865 +/- 0.844		
SEL: N (j) = 0.0	373.865 +/- 0.844		
SEL: 250.0 > PT <= 400.0	63.53 +/- 6.88		

Region: "NJ0_400_inf"			
Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	373.865 +/- 0.844		
SEL: N (j) = 0.0	373.865 +/- 0.844		
SEL: PT (l[1] l[2]) > 400.0	32.31 +/- 5.21		

Region: "NJ1_400_inf"			
Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	373.865 +/- 0.844		
SEL: N (j) = 1.0	0.0 +/- 0.0		
SEL: PT (l[1] l[2]) > 400.0	0.0 +/- 0.0		

Region: "NJ2_400_inf"			
Cuts	Signal (S)	Background (B)	S vs B
Initial (no cut)	373.865 +/- 0.844		
SEL: N (j) >= 2.0	0.0 +/- 0.0		
SEL: PT (l[1] l[2]) > 400.0	0.0 +/- 0.0		