

The difference between hybrid and Luarlw exceeds five percent.

\sqrt{s} (GeV)	LUARLW ε_{had} (%)	Hybrid ε_{had} (%)	Δ_{rel} (%)
2.2324	64.45	64.50	-0.09
2.4000	67.29	67.62	-0.49
2.8000	72.25	73.16	-1.25
3.0500	73.91	74.54	-0.85
3.0600	73.88	74.54	-0.90
3.0800	73.98	74.11	-0.18
3.4000	74.81	75.19	-0.50
3.5000	75.32	75.88	-0.75
3.5424	75.58	76.17	-0.78
3.5538	75.50	76.23	-0.97
3.5611	75.50	76.27	-1.02
3.6002	75.73	76.52	-1.05
3.6500	76.00	76.89	-1.16
3.6710	76.11	77.11	-1.30

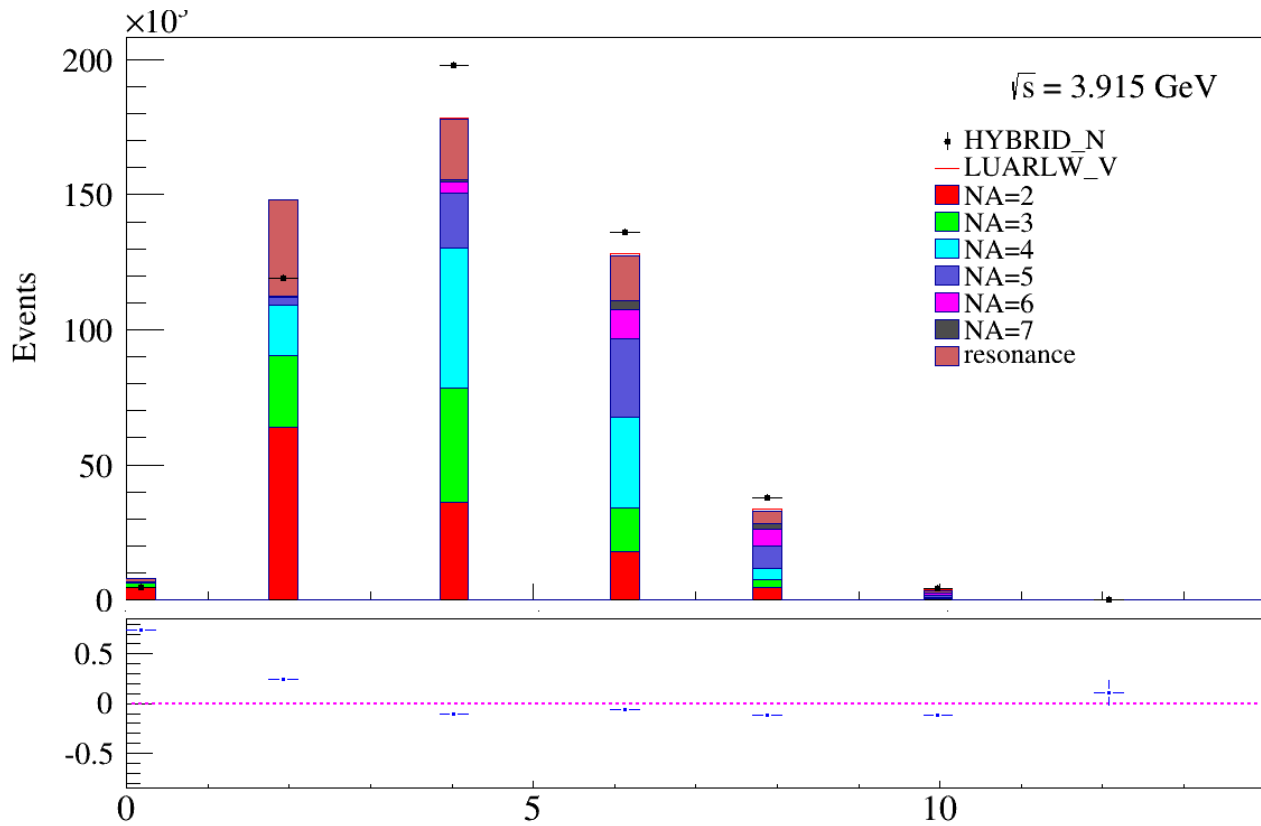
A significant change in Luarlw from 3.67 to 3.85 compared to the low-energy region.

3.85000	0.726286	3.85000	0.787650
3.89000	0.726456	3.89000	0.790510
3.91500	0.730028	3.91500	0.796908
3.94000	0.735720	3.94000	0.801324
3.96500	0.742868	3.96500	0.806248
3.99000	0.750968	3.99000	0.814378
4.01200	0.756932	4.01200	0.825056
4.02500	0.761354	4.02500	0.832244
4.05500	0.769002	4.05500	0.835938
4.09000	0.771732	4.09000	0.835088
4.14000	0.781322	4.14000	0.838484
4.18000	0.804176	4.18000	0.841322
4.20600	0.800228	4.20600	0.835014
4.23000	0.786260	4.23000	0.826898
4.24800	0.777364	4.24800	0.823006
4.27000	0.770068	4.27000	0.824372
4.30000	0.773146	4.30000	0.825398
4.35000	0.784362	4.35000	0.832112
4.39500	0.818344	4.39500	0.844962
4.43000	0.830104	4.43000	0.846786
4.50000	0.799558	4.50000	0.840734
4.57000	0.784986	4.57000	0.839316
4.60000	0.788837	4.60000	0.841918
4.62000	0.786420	4.62000	0.837902
4.66000	0.789137	4.66000	0.839355
4.70000	0.791852	4.70000	0.840781
4.75000	0.796897	4.75000	0.843086
4.84000	0.802562	4.84000	0.843584
4.94600	0.805076	4.94600	0.843116

Luarlw

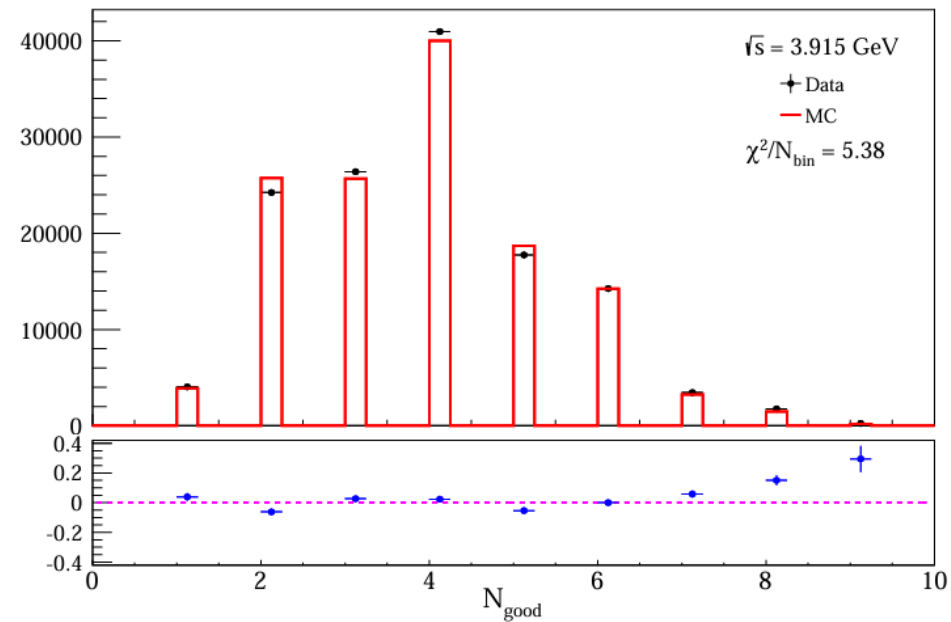
Hybrid

Taking 3.915 GeV as example

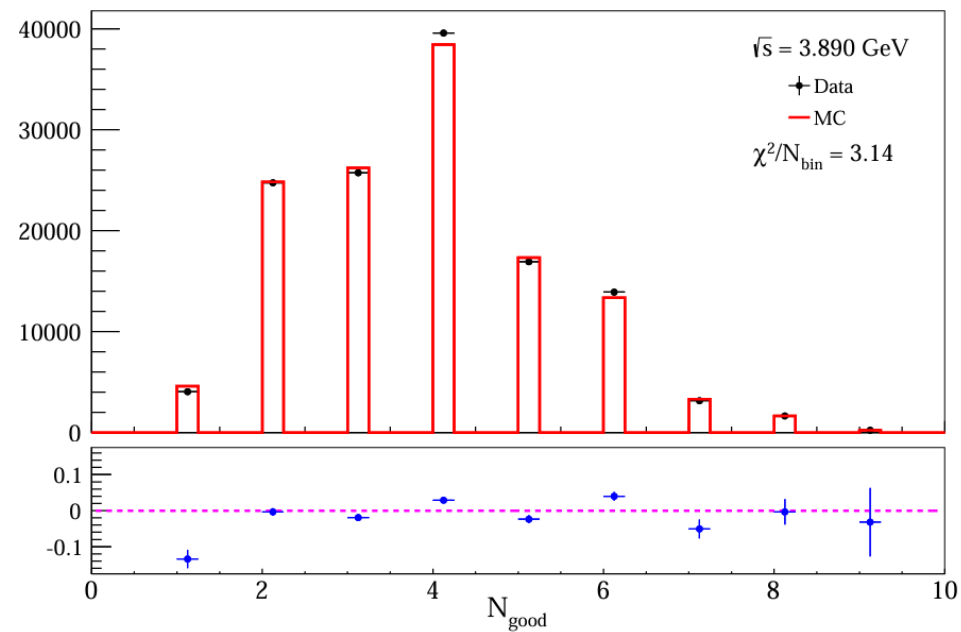


Comparing the ncharge of the two MC

Luarlw



Hybrid



Taking 3.915 GeV as example

Cut-Flow		hybridN		luarlwV		luarlwU	
		N_{MC}^{sur}	ε (%)	N_{MC}^{sur}	ε (%)	N_{MC}^{sur}	ε (%)
Total Events		500000		500000		500000	
Veto Bhabha		499208	99.84	499036	99.81	499000	99.80
$N_{good} \geq 1$		478118	95.78	457810	91.74	457775	91.74
$N_{good} = 1$	Total	50487	10.56	49801	10.88	48981	10.70
	$E_{tot} \geq E_{beam}$	18800	37.24	21182	42.53	20936	42.74
	$N_{\pi^0} \geq 1$	15595	82.95	15024	70.93	15062	71.94
	Balance $\in (0, 0.75)$	13779	88.36	10937	72.80	10855	72.07
$N_{good} = 2$	Total	96626	20.21	107164	23.41	104897	22.91
	$\Delta\theta$ & $\Delta\phi$	93952	97.23	99993	93.31	97622	93.06
	$N_{isogam} \geq 2$	75671	80.54	72647	72.65	71022	72.75
$N_{good} = 3$	Total	91805	19.20	80975	17.69	80214	17.52
	$\Delta\theta$ & $\Delta\phi$	88271	96.15	76283	94.21	75615	94.27
	$N(E/P > 0.8) \geq 2$	85288	96.62	73947	96.94	73263	96.89
	$N(r_{pid} > 0.25) \geq 2$	83583	98.00	72497	98.04	71865	98.09
$N_{good} \geq 4$		239200	50.03	219870	48.03	223683	48.86
Final Events: $N_{good} \geq 1$		239200	47.84	219870	43.97	223683	44.74
Final Events: $N_{good} \geq 2$		225421	45.08	208933	41.79	212828	42.57
Final Events: $N_{good} \geq 3$		149750	29.95	136286	27.26	141806	28.36

topology of different ncharge in mctruth

Luarlw														
ncharge=0					ncharge=2					ncharge=4				
channel	events	ratio(%)	total ratio(%)	eff(%)	channel	events	ratio(%)	total ratio(%)	eff(%)	channel	events	ratio(%)	total ratio(%)	eff(%)
$\pi^0 2\gamma$	811	10.06	0.16	1.11	$\pi^+\pi^-$	36763	24.79	7.35	0.24	$3\pi^0 2\pi^+ 2\pi^-$	14430	8.10	2.89	98.80
$3\pi^0$	808	10.02	0.16	2.48	K^+K^-	7505	5.06	1.50	0.44	$2\pi^0 2\pi^+ 2\pi^-$	10064	5.65	2.01	94.73
$4\pi^0$	730	9.05	0.15	2.33	$2\pi^0 \pi^+ \pi^-$	6225	4.20	1.25	75.42	$\pi^+ \pi^- K^+ K^-$	7914	4.44	1.58	81.35
$2\pi^0 K_L^0$	667	8.27	0.13	0.75	$\pi^0 \pi^+ \pi^-$	5564	3.75	1.11	29.06	$2\pi^+ 2\pi^-$	5957	3.34	1.19	86.10
$n\bar{n}$	645	8.00	0.13	0	$3\pi^0 \pi^+ \pi^-$	4177	2.82	0.84	91.50	$\pi^0 \pi^+ \pi^- K^+ K^-$	5835	3.27	1.17	90.61
$K_L^0 K_L^0$	404	5.01	0.08	0	$K_L^0 \pi^+ K^-$	3954	2.67	0.79	12.57	$\pi^0 2\pi^+ 2\pi^-$	4167	2.34	0.83	87.71

Hybrid														
ncharge=0					ncharge=2					ncharge=4				
channel	events	ratio(%)	total ratio(%)	eff(%)	channel	events	ratio(%)	total ratio(%)	eff(%)	channel	events	ratio(%)	total ratio(%)	eff(%)
$2\pi^0 K_L^0$	437	9.45	0.09	0	$\pi^+\pi^-$	27615	23.20	5.52	1.45	$2\pi^0 2\pi^+ 2\pi^-$	19777	9.98	3.96	97.60
$n\bar{n}$	171	3.70	0.03	0	$2\pi^0 \pi^+ \pi^-$	11681	9.81	2.34	65.86	$2\pi^+ 2\pi^-$	8288	4.18	1.66	88.02
$2\pi^0 2\gamma$	157	3.40	0.03	4.46	$\pi^0 \pi^+ \pi^-$	5374	4.52	1.07	26.20	$\pi^0 \pi^+ \pi^- K^+ K^-$	6867	3.47	1.37	97.80
$3\pi^0 2\gamma$	145	3.14	0.03	5.52	$3\pi^0 \pi^+ \pi^-$	5412	4.55	1.08	95.10	$\pi^0 2\pi^+ 2\pi^-$	4557	2.30	0.91	99.01
$3\pi^0 K_L^0$	136	2.94	0.03	14.7	K^+K^-	2851	2.40	0.57	1.79	$\pi^+ \pi^- K^+ K^-$	4437	2.24	0.89	84.08
$5\pi^0$	101	2.18	0.02	3.96	e^+e^-	1421	1.19	0.28	0	$3\pi^0 2\pi^+ 2\pi^-$	3594	1.81	0.72	98.04

