1 GGdirect 1600 0

- Process: $pp \to \tilde{g}\tilde{g}, \tilde{g} \to q\tilde{\chi}_1^0$
- Parameters: $(m_{\tilde{g}}, m_{\tilde{\chi}_1^0}) = (1600, 0)\,\text{GeV}$
- Number of Atom MC events: 619
- Event Generator: `MadGraph5 + Pythia6`

#	cut name	ϵ_{Exp} (%)	ϵ_{Atom} (%)	$\frac{\text{Atom}}{\text{Exp}}$	$\frac{(\text{Exp}-\text{Atom})}{\text{Error}}$	#/?	R_{Exp} (%)	R_{Atom} (%)	$\frac{\text{Atom}}{\text{Exp}}$	$\frac{(\text{Exp}-\text{Atom})}{\text{Error}}$	$\partial \log \epsilon_{\text{Atom}} / \partial \log x_{\text{cut}}$
1	Preselection, MET > 200, $p_T^{j_1} > 200$	90.18 0.95	$91.9^{+1.1}_{-1.1}$	1.02	1.18	0	90.18 0.95	$91.9^{+1.1}_{-1.1}$	1.02	1.18	$0.19^{+0.3}_{0.29}$
2	$N_j \geq 2$: 2jl	90.18 ± 0.95	$91.9^{+1.1}_{-1.1}$	1.02	1.18	1	100.0 ± 3.8	$100.0^{+1.69}_{-1.69}$	1.0	0.0	$0.0^{+0.0}_{0.0}$
3	$\Delta\phi_{min} > 0.8$: 2jl	54.97 ± 0.74	$56.1^{+2.0}_{-2.0}$	1.02	0.53	2	60.96 ± 3.37	$61.04^{+2.3}_{-2.3}$	1.0	0.02	$0.0^{+0.0}_{0.0}$
4	$p_T^{j_2} > 200$: 2jl	54.26 ± 0.74	$55.6^{+2.0}_{-2.0}$	1.02	0.63	3	98.71 ± 2.96	$99.11^{+5.02}_{-5.02}$	1.0	0.07	$0.0^{+0.0}_{0.0}$
5	MET/$\sqrt{H_T} > 15$: 2jl	29.16 ± 0.54	$45.6^{+2.0}_{-2.0}$	1.56	7.94	4	53.74 ± 2.54	$82.01^{+4.65}_{-4.65}$	1.53	5.34	$0.0^{+0.0}_{0.0}$
6	$m_{\text{eff}}^{\text{inc}} > 1200$: 2jl	29.13 ± 0.54	$45.6^{+2.0}_{-2.0}$	1.57	7.95	5	99.9 ± 2.16	$100.0^{+6.2}_{-6.2}$	1.0	0.02	$0.0^{+0.0}_{0.0}$
7	$p_T^{j_1} > 300$: 2jm	89.75 ± 0.95	$91.5^{+1.1}_{-1.1}$	1.02	1.21	0	99.52 ± 114.88	$99.56^{+155.56}_{155.56}$	1.0	0.0	$0.0^{+0.0}_{0.0}$
8	$N_j \geq 2$: 2jm	89.75 ± 0.95	$91.5^{+1.1}_{-1.1}$	1.02	1.21	7	100.0 ± 3.79	$100.0^{+1.7}_{-1.7}$	1.0	0.0	$0.0^{+0.0}_{0.0}$
9	$\Delta\phi_{min} > 0.4$: 2jm	72.16 ± 0.85	$73.2^{+1.8}_{-1.8}$	1.01	0.52	8	80.4 ± 3.59	$80.0^{+2.19}_{-2.19}$	1.0	-0.1	$0.0^{+0.0}_{0.0}$
10	$p_T^{j_2} > 50$: 2jm	72.16 ± 0.85	$73.2^{+1.8}_{-1.8}$	1.01	0.52	9	100.0 ± 3.4	$100.0^{+3.48}_{-3.48}$	1.0	0.0	$0.0^{+0.0}_{0.0}$
11	MET/$\sqrt{H_T} > 15$: 2jm	34.76 ± 0.59	$59.5^{+2.0}_{-1.9}$	1.71	12.44	10	48.17 ± 2.85	$81.28^{+3.39}_{-3.28}$	1.69	7.62	$0.0^{+0.0}_{0.0}$
12	$m_{\text{eff}}^{\text{inc}} > 1600 : 2jm$	34.28 ± 0.59	$58.2^{+2.0}_{-1.9}$	1.7	12.03	11	98.62 ± 2.35	$97.82^{+4.59}_{-4.58}$	0.99	-0.16	$0.0^{+0.0}_{0.0}$
13	$Nj \geq 2$: 2jt	91.08 ± 0.95	$91.9^{+1.1}_{-1.1}$	1.01	0.56	0	101.0 ± 114.96	$100.0^{+155.56}_{155.56}$	0.99	-0.01	$0.0^{+0.0}_{0.0}$
14	$\Delta\phi_{min} > 0.8$: 2jt	54.97 ± 0.74	$56.1^{+2.0}_{-2.0}$	1.02	0.53	13	60.35 ± 3.38	$61.04^{+2.3}_{-2.3}$	1.01	0.17	$0.0^{+0.0}_{0.0}$
15	$p_T^{j_2} > 200$: 2jt	54.26 ± 0.74	$55.6^{+2.0}_{-2.0}$	1.02	0.63	14	98.71 ± 2.96	$99.11^{+5.02}_{-5.02}$	1.0	0.07	$0.0^{+0.0}_{0.0}$
16	MET/$\sqrt{H_T} > 20$: 2jl	16.7 ± 0.41	$15.5^{+1.5}_{-1.4}$	0.93	-0.77	15	30.78 ± 2.24	$27.88^{+2.88}_{-2.71}$	0.91	-0.79	$0.0^{+0.0}_{0.0}$
17	$m_{\text{effinc}} > 2000 : 2jt$	15.97 ± 0.4	$14.7^{+1.5}_{-1.4}$	0.92	-0.82	16	95.63 ± 1.62	$94.84^{+12.92}_{-12.88}$	0.99	-0.06	$0.0^{+0.0}_{0.0}$
18	$N_j \geq 4$: 4jt	85.7 ± 0.93	$90.0^{+1.2}_{-1.2}$	1.05	2.84	0	95.03 ± 114.64	$97.93^{+162.79}_{162.79}$	1.03	0.01	$0.0^{+0.0}_{0.0}$
19	$\Delta\phi_{min}$ cut: 4jt	59.69 ± 0.77	$60.2^{+2.0}_{-1.9}$	1.01	0.25	18	69.65 ± 3.39	$66.89^{+2.39}_{-2.29}$	0.96	-0.67	$0.2^{+0.37}_{0.36}$
20	$p_T^{j_2} > 100$: 4jt	59.69 ± 0.77	$60.0^{+2.0}_{-1.9}$	1.01	0.15	19	100.0 ± 3.09	$99.67^{+4.58}_{-4.57}$	1.0	-0.06	$0.0^{+0.0}_{0.0}$
21	$p_T^{j_4} > 100$: 4jt	52.27 ± 0.72	$54.4^{+2.0}_{-2.0}$	1.04	1.0	20	87.57 ± 2.99	$90.67^{+4.4}_{-4.5}$	1.04	0.57	$0.0^{+0.0}_{0.0}$
22	Aplanarity > 0.04: 4jt	35.62 ± 0.6	$54.4^{+2.0}_{-2.0}$	1.53	9.0	21	68.15 ± 2.63	$100.0^{+5.2}_{-5.2}$	1.47	5.47	$0.0^{+0.0}_{0.0}$
23	MET/$\sqrt{H_T} > 0.2$" 4jt	25.24 ± 0.5	$35.8^{+2.0}_{-1.9}$	1.42	5.37	22	70.86 ± 2.19	$65.81^{+4.4}_{-4.25}$	0.93	-1.03	$0.0^{+0.0}_{0.0}$
24	$m_{\text{eff}}^{\text{inc}} > 2200 : 4jt$	21.38 ± 0.46	$30.2^{+1.9}_{-1.8}$	1.41	4.75	23	84.71 ± 1.93	$84.36^{+6.94}_{-6.89}$	1.0	-0.05	$0.0^{+0.0}_{0.0}$
25	$N_j \geq 5$: 5j	64.34 ± 0.8	$77.3^{+1.7}_{-1.7}$	1.2	6.89	0	71.35 ± 113.22	$84.11^{+202.48}_{202.48}$	1.18	0.06	$0.0^{+0.0}_{0.0}$
26	$\Delta\phi_{min}$ cut: 5j	43.61 ± 0.66	$49.8^{+2.0}_{-2.0}$	1.14	2.94	25	67.78 ± 2.92	$64.42^{+2.95}_{-2.95}$	0.95	-0.81	$0.23^{+0.4}_{0.4}$
27	$p_T^{j_2} > 100$: 5j	43.61 ± 0.66	$49.8^{+2.0}_{-2.0}$	1.14	2.94	26	100.0 ± 2.64	$100.0^{+5.68}_{-5.68}$	1.0	0.0	$0.0^{+0.0}_{0.0}$
28	$p_T^{j_5} > 50$: 5j	40.18 ± 0.63	$49.8^{+2.0}_{-2.0}$	1.24	4.59	27	92.13 ± 2.59	$100.0^{+5.68}_{-5.68}$	1.09	1.26	$0.0^{+0.0}_{0.0}$
29	Aplanarity > 0.04: 5j	28.62 ± 0.53	$49.8^{+2.0}_{-2.0}$	1.74	10.23	28	71.23 ± 2.33	$100.0^{+5.68}_{-5.68}$	1.4	4.69	$0.0^{+0.0}_{0.0}$
30	MET/$m_{\text{eff}}(N_j) > 0.25$" 5j	14.01 ± 0.37	$23.5^{+1.8}_{-1.6}$	1.68	5.78	29	48.95 ± 1.8	$47.19^{+4.08}_{-3.73}$	0.96	-0.4	$0.0^{+0.0}_{0.0}$
31	$m_{\text{eff}}^{\text{inc}} > 1600$: 5j	13.88 ± 0.37	$23.2^{+1.8}_{-1.6}$	1.67	5.67	30	99.07 ± 1.49	$98.72^{+10.19}_{-10.18}$	1.0	-0.03	$0.0^{+0.0}_{0.0}$
32	$N_j \geq 6$: 6jm	36.83 ± 0.61	$55.5^{+2.0}_{-2.0}$	1.51	8.93	0	40.84 ± 110.75	$60.39^{+228.25}_{228.25}$	1.48	0.08	$0.0^{+0.0}_{0.0}$
33	$\Delta\phi_{min}$ cut: 6jm	23.72 ± 0.49	$35.3^{+2.0}_{-1.9}$	1.49	5.9	32	64.4 ± 2.18	$63.6^{+4.27}_{-4.12}$	0.99	-0.17	$0.32^{+0.48}_{0.47}$
34	$p_T^{j_2} > 100$: 6jm	23.72 ± 0.49	$35.3^{+2.0}_{-1.9}$	1.49	5.9	33	100.0 ± 1.95	$100.0^{+7.81}_{-7.81}$	1.0	0.0	$0.0^{+0.0}_{0.0}$
35	$p_T^{j_6} > 50$: 6jm	22.56 ± 0.47	$35.3^{+2.0}_{-1.9}$	1.56	6.51	34	95.11 ± 1.92	$100.0^{+7.81}_{-7.81}$	1.05	0.61	$0.0^{+0.0}_{0.0}$
36	Aplanarity > 0.04: 6jm	16.87 ± 0.41	$35.3^{+2.0}_{-1.9}$	2.09	9.48	35	74.78 ± 1.77	$100.0^{+7.81}_{-7.81}$	1.34	3.15	$0.0^{+0.0}_{0.0}$
37	MET/$m_{\text{eff}}(N_j) > 0.25$" 6jm	7.55 ± 0.27	$12.7^{+1.4}_{-1.3}$	1.68	3.88	36	44.75 ± 1.36	$35.98^{+4.41}_{-4.21}$	0.8	-1.9	$0.0^{+0.0}_{0.0}$
38	$m_{\text{eff}}^{\text{inc}} > 1600$: 6jm	7.46 ± 0.27	$12.7^{+1.4}_{-1.3}$	1.7	3.94	37	98.81 ± 1.1	$100.0^{+15.04}_{-15.04}$	1.01	0.08	$0.0^{+0.0}_{0.0}$
39	$N_j \geq 6$: 6jt	36.83 ± 0.61	$55.5^{+2.0}_{-2.0}$	1.51	8.93	0	40.84 ± 110.75	$60.39^{+228.25}_{228.25}$	1.48	0.08	$0.0^{+0.0}_{0.0}$
40	$\Delta\phi_{min}$ cut: 6jt	23.72 ± 0.49	$35.3^{+2.0}_{-1.9}$	1.49	5.9	39	64.4 ± 2.18	$63.6^{+4.27}_{-4.12}$	0.99	-0.17	$0.32^{+0.48}_{0.47}$
41	$p_T^{j_2} > 100$: 6jt	23.72 ± 0.49	$35.3^{+2.0}_{-1.9}$	1.49	5.9	40	100.0 ± 1.95	$100.0^{+7.81}_{-7.81}$	1.0	0.0	$0.0^{+0.0}_{0.0}$
42	$p_T^{j_2} > 100$: 6jt	22.56 ± 0.47	$35.3^{+2.0}_{-1.9}$	1.56	6.51	41	95.11 ± 1.92	$100.0^{+7.81}_{-7.81}$	1.05	0.61	$0.0^{+0.0}_{0.0}$
43	Aplanarity > 0.04: 6jt	16.87 ± 0.41	$35.3^{+2.0}_{-1.9}$	2.09	9.48	42	74.78 ± 1.77	$100.0^{+7.81}_{-7.81}$	1.34	3.15	$0.0^{+0.0}_{0.0}$
44	MET/$m_{\text{eff}}(N_j) > 0.25$: 6jt	10.63 ± 0.33	$20.3^{+1.7}_{-1.6}$	1.91	5.92	43	63.01 ± 1.47	$57.51^{+5.72}_{-5.58}$	0.91	-0.93	$0.0^{+0.0}_{0.0}$
45	$m_{\text{eff}}^{\text{inc}} > 1600$: 6jt	9.9 ± 0.31	$19.0^{+1.6}_{-1.5}$	1.92	5.94	44	93.13 ± 1.28	$93.6^{+10.8}_{-10.77}$	1.0	0.04	$0.0^{+0.0}_{0.0}$

Table 1: