Validation of atlas_1507_05493

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Analysis: atlas_1507_05493

Energy: 8 TeV

Luminosity: 20.3 fb^{-1}

This analysis comprises 10 signal regions dubbed:

$\mathbf{SR}^{\gamma\gamma}_{\text{SL}}$, $\mathbf{SR}^{\gamma\gamma}_{\text{SH}}$, $\mathbf{SR}^{\gamma\gamma}_{\text{WL}}$, $\mathbf{SR}^{\gamma\gamma}_{\text{WH}}$, $\mathbf{SR}^{\gamma j}_{\text{L}}$, $\mathbf{SR}^{\gamma j}_{\text{H}}$, $\mathbf{SR}^{\gamma b}_{\text{L}}$, $\mathbf{SR}^{\gamma b}_{\text{H}}$, $\mathbf{SR}^{\gamma \ell}_{e}$, $\mathbf{SR}^{\gamma \ell}_{\mu}$

Signal Region: $\mathbf{SR}^{\gamma\gamma}_{\text{SL}}$

	ATLAS	CM2
$N_\gamma(E_T\,[\text{GeV}]) > 1(> 75)$	0.2185	0.3424
$\Delta\phi_{\text{min}}(\text{jet}, \text{E}_\text{T}^\text{miss}) > 0.5$	0.1906	0.2526
m_{eff} [GeV] >1800	0.1627	0.1918
$\text{E}_\text{T}^\text{miss}$ [GeV] > 150	0.1305	0.1512

Table 1: Cutflows for the $\text{SR}^{\gamma\gamma}_{\text{SL}}$ signal region. ATLAS numbers are extracted from Table 4 of Auxiliary Tables of atlas_1507_05493.

Signal Region: $\mathbf{SR}^{\gamma\gamma}_{\text{SH}}$

	ATLAS	CM2
$N_\gamma(E_T\,[\text{GeV}]) > 1(> 75)$	0.2119	0.2684
$\Delta\phi_{\text{min}}(\text{jet}, \text{E}_\text{T}^\text{miss}) > 0.5$	0.1591	0.184
$\Delta\phi_{\text{min}}(\gamma, \text{E}_\text{T}^\text{miss}) > 0.5$	0.1485	0.1724
m_{eff} [GeV] >1500	0.1206	0.1436
$\text{E}_\text{T}^\text{miss}$ [GeV] > 250	0.1112	0.1344

Table 2: Cutflows for the $\text{SR}^{\gamma\gamma}_{\text{SH}}$ signal regions. ATLAS numbers are extracted from Table 4 of Auxiliary Tables of atlas_1507_05493.

Signal Region: $\mathbf{SR}^{\gamma\gamma}_{\mathrm{WL}}$

	ATLAS	CM2
$N_\gamma(E_T\,[\mathrm{GeV}]) > 1(> 75)$	0.2578	0.5214
$\Delta\phi_{\mathrm{min}}(\mathrm{jet}, \mathrm{E}_{\mathrm{T}}^{\mathrm{miss}}) > 0.5$	0.2316	0.4094
$H_{\mathrm{T}}\,[\mathrm{GeV}]$ >600	0.2014	0.3336
$\mathrm{E}_{\mathrm{T}}^{\mathrm{miss}}\,[\mathrm{GeV}] > 150$	0.1068	0.1818

Table 3: Cutflows for the $\mathrm{SR}^{\gamma\gamma}_{\mathrm{WL}}$ signal regions. ATLAS numbers are extracted from Table 4 of Auxiliary Tables of atlas_1507_05493. .

Signal Region: $\mathbf{SR}^{\gamma\gamma}_{\mathrm{WH}}$

	ATLAS	CM2
$N_\gamma(E_T\,[\mathrm{GeV}]) > 1(> 75)$	0.2417	0.315
$\Delta\phi_{\mathrm{min}}(\mathrm{jet}, \mathrm{E}_{\mathrm{T}}^{\mathrm{miss}}) > 0.5$	0.2276	0.2312
$\Delta\phi_{\mathrm{min}}(\gamma, \mathrm{E}_{\mathrm{T}}^{\mathrm{miss}}) > 0.5$	0.2145	0.2196
$H_{\mathrm{T}}\,[\mathrm{GeV}] > 400$	0.1934	0.206
$\mathrm{E}_{\mathrm{T}}^{\mathrm{miss}}\,[\mathrm{GeV}] > 200$	0.1380	0.1506

Table 4: Cutflows for the $\mathrm{SR}^{\gamma\gamma}_{\mathrm{WH}}$ signal regions. ATLAS numbers are extracted from Table 4 of Auxiliary Tables of atlas_1507_05493.

Signal Region: $\mathbf{SR}^{\gamma j}_{\mathrm{L}}$

	ATLAS	CM2
$N_\gamma(E_T\,[\mathrm{GeV}]) = 1(> 125)$	0.5328	0.6242
$N_{\mathrm{lep}} = 0$, $N_{\mathrm{jets}}(\mathrm{p}_{\mathrm{T}}^1, \mathrm{p}_{\mathrm{T}}^2[\mathrm{GeV}]) > 3$ (100, 40)	0.2519	0.2542
$\Delta\phi_{\mathrm{min}}(\mathrm{jet}, \mathrm{E}_{\mathrm{T}}^{\mathrm{miss}}) > 0.4$	0.2164	0.217
$R_T^4 < 0.85$	0.1410	0.0778
$\mathrm{E}_{\mathrm{T}}^{\mathrm{miss}}\,[\mathrm{GeV}] > 200$	0.1130	0.065

Table 5: Cutflows for the $\mathrm{SR}^{\gamma j}_{\mathrm{L}}$ signal regions. ATLAS numbers are extracted from Table 4 of Auxiliary Tables of atlas_1507_05493.

Signal Region: $\mathbf{SR}_{\mathrm{H}}^{\gamma j}$

	ATLAS	CM2
$N_\gamma(E_T\,[\mathrm{GeV}]) = 1(> 300)$	0.3158	0.1008
$N_{\mathrm{lep}} = 0,\ N_{\mathrm{jets}}(\mathrm{p}_{\mathrm{T}}^1, \mathrm{p}_{\mathrm{T}}^2[\mathrm{GeV}]) > 1\ (100,\ 40)$	0.2877	0.0844
$\Delta\phi_{\mathrm{min}}(\mathrm{jet}, \mathrm{E}_{\mathrm{T}}^{\mathrm{miss}}) > 0.4$	0.2570	0.0736
$\Delta\phi_{\mathrm{min}}(\mathrm{jet}, \gamma) < 2.0$	0.1465	0.059
$H_{\mathrm{T}}\,[\mathrm{GeV}] > 800$	0.1377	0.0572
$\mathrm{E}_{\mathrm{T}}^{\mathrm{miss}}\,[\mathrm{GeV}] > 300$	0.1368	0.0516

Table 6: Cutflows for the $\mathrm{SR}_{\mathrm{H}}^{\gamma j}$ signal regions. ATLAS numbers are extracted from Table 4 of Auxiliary Tables of atlas_1507_05493.

Signal Region: $\mathbf{SR}_{\mathrm{L}}^{\gamma b}$

	ATLAS	CM2
$p_T^\gamma > 125$ GeV	0.074	0.0788
$2 \leq n_{\mathrm{jets}} \leq 4$	0.042	0.041
One b-tagged jet	0.015	0.0148
Two b-tagged jets	0.0054	0.0044
Lepton Veto	0.0054	0.0042
$\mathrm{E}_{\mathrm{T}}^{\mathrm{miss}}\,[\mathrm{GeV}] > 100$	0.0011	0.001
$\mathrm{M}_{\mathrm{T}}^{\gamma,\mathrm{E}_{\mathrm{T}}^{\mathrm{miss}}}\,[\mathrm{GeV}] > 90$	0.00086	0.0008
$\Delta\phi_{\mathrm{min}}(\mathrm{jet}, \mathrm{E}_{\mathrm{T}}^{\mathrm{miss}}) > 0.3$	0.00069	0.0006
$75 < m_{bb}[\mathrm{GeV}] < 150$	0.00059	0.0004

Table 7: Cutflows for the $\mathrm{SR}_{\mathrm{L}}^{\gamma b}$ signal regions. ATLAS numbers are extracted from Table 6 of Auxiliary Tables of atlas_1507_05493.

Signal Region: $\mathbf{SR}_{\mathrm{H}}^{\gamma b}$		
	ATLAS	CM2
$p_T^{\gamma} > 150$ GeV	0.4018	0.4422
$n_{\mathrm{jets}} \geq 4$	0.3642	0.3652
One b-tagged jet	0.2778	0.2622
$\mathrm{E_T^{miss}}\,[\mathrm{GeV}] > 200$	0.2428	0.2302
$\mathrm{M_T^{\gamma,E_T^{miss}}}\,[\mathrm{GeV}] > 90$	0.2416	0.2284
$\Delta\phi_{\mathrm{min}}(\mathrm{jet}, \mathrm{E_T^{miss}}) > 0.3$	0.1852	0.204
$H_{\mathrm{T}}\,[\mathrm{GeV}] > 1000$	0.1577	0.1738

Table 8: Cutflows for the $\mathrm{SR}_{\mathrm{H}}^{\gamma b}$ signal regions. ATLAS numbers are extracted from Table 5 of Auxiliary Tables of atlas_1507_05493.

Signal Region: $\mathbf{SR}_{e}^{\gamma \ell}$		
	ATLAS	CM2
$N_\gamma(E_T\,[\mathrm{GeV}]) > 0 (> 125)$	0.4089	0.1655
$N_e > 0$, $\Delta R(\ell, \gamma) > 0.7$, $\lvert M_{e\gamma} - M_Z[\mathrm{GeV}]\rvert > 15$	0.0321	0.012
$\mathrm{M_T^{\gamma,E_T^{miss}}}\,[\mathrm{GeV}] > 90$	0.0169	0.0076
$H_{\mathrm{T}}^{\mathrm{jets}}\,[\mathrm{GeV}] < 100$	0.0146	0.0058
$\mathrm{E_T^{miss}}\,[\mathrm{GeV}] > 120$	0.0126	0.0044

Table 9: Cutflows for the $\mathrm{SR}_{e}^{\gamma \ell}$ signal regions. ATLAS numbers are extracted from Table 4 of Auxiliary Tables of atlas_1507_05493.

Signal Region: $\mathbf{SR}_{\mu}^{\gamma \ell}$		
	ATLAS	CM2
$N_\gamma(E_T\,[\mathrm{GeV}]) > 0 (> 125)$	0.4089	0.1656
$N_\mu > 0$, $\Delta R(\ell, \gamma) > 0.7$	0.0322	0.0206
$\mathrm{M_T^{\gamma,E_T^{miss}}}\,[\mathrm{GeV}] > 90$	0.0167	0.0082
$H_{\mathrm{T}}^{\mathrm{jets}}\,[\mathrm{GeV}] < 100$	0.0141	0.0066
$\mathrm{E_T^{miss}}\,[\mathrm{GeV}] > 120$	0.0121	0.0056

Table 10: Cutflows for the $\mathrm{SR}_{\mu}^{\gamma \ell}$ signal regions. ATLAS numbers are extracted from Table 4 of Auxiliary Tables of atlas_1507_05493.