	PYTHIA MC09 tune			
PMT cut [p.e]	ε^A	ε^C	ε^{OR}	ε^{AND}
0	0.999900 ± 0.000050	0.999925 ± 0.000043	1.000000 ± 0.000000	0.999825 ± 0.000066
1	0.676225 ± 0.002340	0.681350 ± 0.002330	0.860350 ± 0.001733	0.497225 ± 0.002500
2	0.603325 ± 0.002446	0.609025 ± 0.002440	0.799850 ± 0.002001	0.412500 ± 0.002461
3	0.572450 ± 0.002474	0.579000 ± 0.002469	0.776275 ± 0.002084	0.375175 ± 0.002421
4	0.550750 ± 0.002487	0.555825 ± 0.002484	0.757900 ± 0.002142	0.348675 ± 0.002383
5	0.530800 ± 0.002495	0.536900 ± 0.002493	0.740925 ± 0.002191	0.326775 ± 0.002345
6	0.515100 ± 0.002499	0.522375 ± 0.002497	0.727875 ± 0.002225	0.309600 ± 0.002312
7	0.499925 ± 0.002500	0.509025 ± 0.002500	0.715350 ± 0.002256	0.293600 ± 0.002277
8	0.487600 ± 0.002499	0.496750 ± 0.002500	0.704250 ± 0.002282	0.280100 ± 0.002245
9	0.477000 ± 0.002497	0.485325 ± 0.002499	0.693325 ± 0.002306	0.269000 ± 0.002217
10	0.467400 ± 0.002495	0.475900 ± 0.002497	0.684225 ± 0.002324	0.259075 ± 0.002191
11	0.458675 ± 0.002491	0.467550 ± 0.002495	0.676100 ± 0.002340	0.250125 ± 0.002165
12	0.451450 ± 0.002488	0.460250 ± 0.002492	0.668950 ± 0.002353	0.242750 ± 0.002144
13	0.444225 ± 0.002484	0.453175 ± 0.002489	0.661375 ± 0.002366	0.236025 ± 0.002123
14	0.438200 ± 0.002481	0.447100 ± 0.002486	0.655550 ± 0.002376	0.229750 ± 0.002103
15	0.432075 ± 0.002477	0.440750 ± 0.002482	0.649200 ± 0.002386	0.223625 ± 0.002083
16	0.426750 ± 0.002473	0.435500 ± 0.002479	0.643825 ± 0.002394	0.218425 ± 0.002066
17	0.421700 ± 0.002469	0.429850 ± 0.002475	0.638325 ± 0.002402	0.213225 ± 0.002048
18	0.416475 ± 0.002465	0.424325 ± 0.002471	0.632775 ± 0.002410	0.208025 ± 0.002029
19	0.412000 ± 0.002461	0.419725 ± 0.002468	0.627950 ± 0.002417	0.203775 ± 0.002014
20	0.407550 ± 0.002457	0.416075 ± 0.002465	0.623300 ± 0.002423	0.200325 ± 0.002001
21	0.402425 ± 0.002452	0.411250 ± 0.002460	0.618075 ± 0.002429	0.195600 ± 0.001983
22	0.398200 ± 0.002448	0.406900 ± 0.002456	0.613250 ± 0.002435	0.191850 ± 0.001969
23	0.393475 ± 0.002443	0.402325 ± 0.002452	0.608000 ± 0.002441	0.187800 ± 0.001953
24	0.389600 ± 0.002438	0.398150 ± 0.002448	0.603850 ± 0.002445	0.183900 ± 0.001937
25	0.385725 ± 0.002434	0.393600 ± 0.002443	0.599475 ± 0.002450	0.179850 ± 0.001920
26	0.380400 ± 0.002427	0.388500 ± 0.002437	0.593200 ± 0.002456	0.175700 ± 0.001903
27	0.374450 ± 0.002420	0.382975 ± 0.002431	0.586675 ± 0.002462	0.170750 ± 0.001881
28	0.368925 ± 0.002413	0.377250 ± 0.002423	0.580375 ± 0.002467	0.165800 ± 0.001860
29	0.363075 ± 0.002404	0.371375 ± 0.002416	0.573700 ± 0.002473	0.160750 ± 0.001837
30	0.357075 ± 0.002396	0.365250 ± 0.002408	0.567075 ± 0.002477	0.155250 ± 0.001811
31	0.351000 ± 0.002386	0.358900 ± 0.002398	0.559800 ± 0.002482	0.150100 ± 0.001786
32	0.343925 ± 0.002375	0.351950 ± 0.002388	0.551025 ± 0.002487	0.144850 ± 0.001760
33	0.337050 ± 0.002364	0.344425 ± 0.002376	0.542350 ± 0.002491	0.139125 ± 0.001730
34	0.329975 ± 0.002351	0.337825 ± 0.002365	0.534325 ± 0.002494	0.133475 ± 0.001700

Table A.3: *LUCID efficiency when at least one hit is required on side A (ε^A), on side C (ε^C), either of the sides (ε^{OR}), both sides (ε^{AND}) for pp inelastic collisions and a full ATLAS detector simulation collisions at $\sqrt{s} = 7$ TeV*

	PYTHIA ND			
PMT cut [p.e]	ε^{A}	ε^{C}	ε^{OR}	ε^{AND}
0	1.000000 ± 0.000000	1.000000 ± 0.000000	1.000000 ± 0.000000	1.000000 ± 0.000000
1	0.808000 ± 0.002785	0.809450 ± 0.002777	0.961050 ± 0.001368	0.656400 ± 0.003358
2	0.746300 ± 0.003077	0.747800 ± 0.003071	0.934100 ± 0.001754	0.560000 ± 0.003510
3	0.715250 ± 0.003191	0.714300 ± 0.003194	0.917150 ± 0.001949	0.512400 ± 0.003534
4	0.689450 ± 0.003272	0.687350 ± 0.003278	0.901700 ± 0.002105	0.475100 ± 0.003531
5	0.668950 ± 0.003328	0.665700 ± 0.003336	0.886850 ± 0.002240	0.447800 ± 0.003516
6	0.650300 ± 0.003372	0.647500 ± 0.003378	0.873800 ± 0.002348	0.424000 ± 0.003494
7	0.634350 ± 0.003406	0.631450 ± 0.003411	0.862700 ± 0.002434	0.403100 ± 0.003469
8	0.619350 ± 0.003433	0.616150 ± 0.003439	0.851850 ± 0.002512	0.383650 ± 0.003438
9	0.605400 ± 0.003456	0.604500 ± 0.003457	0.841500 ± 0.002582	0.368400 ± 0.003411
10	0.595200 ± 0.003471	0.594250 ± 0.003472	0.833000 ± 0.002637	0.356450 ± 0.003387
11	0.585450 ± 0.003484	0.583950 ± 0.003485	0.825100 ± 0.002686	0.344300 ± 0.003360
12	0.576850 ± 0.003494	0.574600 ± 0.003496	0.817600 ± 0.002731	0.333850 ± 0.003335
13	0.568800 ± 0.003502	0.566950 ± 0.003504	0.811450 ± 0.002766	0.324300 ± 0.003310
14	0.561100 ± 0.003509	0.559000 ± 0.003511	0.803700 ± 0.002809	0.316400 ± 0.003289
15	0.554250 ± 0.003515	0.551000 ± 0.003517	0.797000 ± 0.002844	0.308250 ± 0.003265
16	0.547900 ± 0.003519	0.543950 ± 0.003522	0.791050 ± 0.002875	0.300800 ± 0.003243
17	0.541500 ± 0.003523	0.537850 ± 0.003525	0.784900 ± 0.002905	0.294450 ± 0.003223
18	0.536200 ± 0.003526	0.531850 ± 0.003528	0.780250 ± 0.002928	0.287800 ± 0.003201
19	0.530750 ± 0.003529	0.527200 ± 0.003530	0.775250 ± 0.002952	0.282700 ± 0.003184
20	0.525000 ± 0.003531	0.521350 ± 0.003532	0.770150 ± 0.002975	0.276200 ± 0.003162
21	0.519600 ± 0.003533	0.516200 ± 0.003534	0.764850 ± 0.002999	0.270950 ± 0.003143
22	0.514250 ± 0.003534	0.511000 ± 0.003535	0.760600 ± 0.003017	0.264650 ± 0.003119
23	0.508000 ± 0.003535	0.505600 ± 0.003535	0.754300 ± 0.003044	0.259300 ± 0.003099
24	0.502500 ± 0.003535	0.500500 ± 0.003536	0.749400 ± 0.003064	0.253600 ± 0.003076
25	0.497900 ± 0.003536	0.494900 ± 0.003535	0.743900 ± 0.003086	0.248900 ± 0.003057
26	0.492250 ± 0.003535	0.488550 ± 0.003535	0.737850 ± 0.003110	0.242950 ± 0.003033
27	0.485750 ± 0.003534	0.483050 ± 0.003534	0.731400 ± 0.003134	0.237400 ± 0.003009
28	0.478950 ± 0.003532	0.475650 ± 0.003531	0.724100 ± 0.003161	0.230500 ± 0.002978
29	0.471450 ± 0.003530	0.468600 ± 0.003529	0.716650 ± 0.003186	0.223400 ± 0.002945
30	0.463550 ± 0.003526	0.461650 ± 0.003525	0.709100 ± 0.003212	0.216100 ± 0.002910
31	0.455700 ± 0.003522	0.453900 ± 0.003520	0.701350 ± 0.003236	0.208250 ± 0.002871
32	0.446900 ± 0.003516	0.444900 ± 0.003514	0.691750 ± 0.003265	0.200050 ± 0.002829
33	0.438650 ± 0.003509	0.436000 ± 0.003506	0.683050 ± 0.003290	0.191600 ± 0.002783
34	0.428800 ± 0.003500	0.427500 ± 0.003498	0.672100 ± 0.003319	0.184200 ± 0.002741

TABLE 1. LUCID efficiency when at least one hit is required on side A (ε^{A}), on side C (ε^{C}), either of the sides (ε^{OR}), both sides (ε^{AND}) for pp inelastic collisions and a full ATLAS detector simulation collisions at $\sqrt{s} = 7$ TeV

	PYTHIA DD			
PMT cut [p.e]	ε^A	ε^C	ε^{OR}	ε^{AND}
0	0.999900 ± 0.000071	0.999950 ± 0.000050	1.000000 ± 0.000000	0.999850 ± 0.000087
1	0.459400 ± 0.003524	0.461550 ± 0.003525	0.720700 ± 0.003172	0.200250 ± 0.002830
2	0.360100 ± 0.003394	0.363450 ± 0.003401	0.604950 ± 0.003457	0.118600 ± 0.002286
3	0.331600 ± 0.003329	0.335550 ± 0.003339	0.567050 ± 0.003504	0.100100 ± 0.002122
4	0.310700 ± 0.003272	0.313450 ± 0.003280	0.536350 ± 0.003526	0.087800 ± 0.002001
5	0.294950 ± 0.003225	0.298800 ± 0.003237	0.514400 ± 0.003534	0.079350 ± 0.001911
6	0.280800 ± 0.003178	0.285150 ± 0.003192	0.494300 ± 0.003535	0.071650 ± 0.001824
7	0.269950 ± 0.003139	0.273550 ± 0.003152	0.477250 ± 0.003532	0.066250 ± 0.001759
8	0.260500 ± 0.003104	0.264800 ± 0.003120	0.463650 ± 0.003526	0.061650 ± 0.001701
9	0.252350 ± 0.003071	0.256550 ± 0.003088	0.450950 ± 0.003518	0.057950 ± 0.001652
10	0.244350 ± 0.003038	0.248850 ± 0.003057	0.438950 ± 0.003509	0.054250 ± 0.001602
11	0.237700 ± 0.003010	0.242350 ± 0.003030	0.429050 ± 0.003500	0.051000 ± 0.001556
12	0.231100 ± 0.002981	0.237850 ± 0.003011	0.420200 ± 0.003490	0.048750 ± 0.001523
13	0.226900 ± 0.002962	0.232900 ± 0.002989	0.412900 ± 0.003481	0.046900 ± 0.001495
14	0.223000 ± 0.002943	0.228550 ± 0.002969	0.406300 ± 0.003473	0.045250 ± 0.001470
15	0.218050 ± 0.002920	0.223900 ± 0.002948	0.398550 ± 0.003462	0.043400 ± 0.001441
16	0.213850 ± 0.002899	0.220400 ± 0.002931	0.392200 ± 0.003452	0.042050 ± 0.001419
17	0.210200 ± 0.002881	0.216050 ± 0.002910	0.385800 ± 0.003442	0.040450 ± 0.001393
18	0.206850 ± 0.002864	0.213000 ± 0.002895	0.380800 ± 0.003434	0.039050 ± 0.001370
19	0.204200 ± 0.002850	0.209750 ± 0.002879	0.375900 ± 0.003425	0.038050 ± 0.001353
20	0.201400 ± 0.002836	0.207200 ± 0.002866	0.371600 ± 0.003417	0.037000 ± 0.001335
21	0.198800 ± 0.002822	0.204300 ± 0.002851	0.366700 ± 0.003408	0.036400 ± 0.001324
22	0.195000 ± 0.002802	0.201450 ± 0.002836	0.361000 ± 0.003396	0.035450 ± 0.001308
23	0.192550 ± 0.002788	0.198500 ± 0.002820	0.356400 ± 0.003387	0.034650 ± 0.001293
24	0.190100 ± 0.002775	0.195550 ± 0.002805	0.351950 ± 0.003377	0.033700 ± 0.001276
25	0.186650 ± 0.002755	0.192450 ± 0.002788	0.346650 ± 0.003365	0.032450 ± 0.001253
26	0.183350 ± 0.002736	0.188500 ± 0.002766	0.340450 ± 0.003351	0.031400 ± 0.001233
27	0.180250 ± 0.002718	0.185200 ± 0.002747	0.334750 ± 0.003337	0.030700 ± 0.001220
28	0.176850 ± 0.002698	0.180000 ± 0.002717	0.327550 ± 0.003319	0.029300 ± 0.001193
29	0.172900 ± 0.002674	0.176100 ± 0.002693	0.321250 ± 0.003302	0.027750 ± 0.001161
30	0.168850 ± 0.002649	0.172550 ± 0.002672	0.315050 ± 0.003285	0.026350 ± 0.001133
31	0.164900 ± 0.002624	0.168600 ± 0.002647	0.308250 ± 0.003265	0.025250 ± 0.001109
32	0.160650 ± 0.002597	0.165000 ± 0.002625	0.301500 ± 0.003245	0.024150 ± 0.001086
33	0.155950 ± 0.002565	0.160150 ± 0.002593	0.293500 ± 0.003220	0.022600 ± 0.001051
34	0.151250 ± 0.002534	0.156350 ± 0.002568	0.286200 ± 0.003196	0.021400 ± 0.001023

TABLE 1. LUCID efficiency when at least one hit is required on side A (ε^A), on side C (ε^C), either of the sides (ε^{OR}), both sides (ε^{AND}) for pp inelastic collisions and a full ATLAS detector simulation collisions at $\sqrt{s} = 7$ TeV

	PYTHIA SD			
PMT cut [p.e]	ε^A	ε^C	ε^{OR}	ε^{AND}
0	0.999900 ± 0.000071	0.999750 ± 0.000112	1.000000 ± 0.000000	0.999650 ± 0.000132
1	0.342900 ± 0.003356	0.341300 ± 0.003353	0.590600 ± 0.003477	0.093600 ± 0.002060
2	0.246000 ± 0.003045	0.242950 ± 0.003033	0.453750 ± 0.003520	0.035200 ± 0.001303
3	0.225950 ± 0.002957	0.225750 ± 0.002956	0.421150 ± 0.003491	0.030550 ± 0.001217
4	0.212650 ± 0.002893	0.212650 ± 0.002893	0.399000 ± 0.003463	0.026300 ± 0.001132
5	0.202650 ± 0.002842	0.201100 ± 0.002834	0.380550 ± 0.003433	0.023200 ± 0.001064
6	0.194200 ± 0.002797	0.191150 ± 0.002780	0.364100 ± 0.003402	0.021250 ± 0.001020
7	0.186150 ± 0.002752	0.184250 ± 0.002741	0.350750 ± 0.003374	0.019650 ± 0.000981
8	0.178850 ± 0.002710	0.178050 ± 0.002705	0.338600 ± 0.003346	0.018300 ± 0.000948
9	0.174100 ± 0.002681	0.172200 ± 0.002670	0.328800 ± 0.003322	0.017500 ± 0.000927
10	0.168500 ± 0.002647	0.166800 ± 0.002636	0.318700 ± 0.003295	0.016600 ± 0.000903
11	0.164250 ± 0.002620	0.162650 ± 0.002610	0.311000 ± 0.003273	0.015900 ± 0.000885
12	0.160900 ± 0.002598	0.158650 ± 0.002583	0.304650 ± 0.003255	0.014900 ± 0.000857
13	0.157250 ± 0.002574	0.154800 ± 0.002558	0.297700 ± 0.003233	0.014350 ± 0.000841
14	0.154200 ± 0.002554	0.151100 ± 0.002532	0.291650 ± 0.003214	0.013650 ± 0.000820
15	0.151350 ± 0.002534	0.148600 ± 0.002515	0.286700 ± 0.003198	0.013250 ± 0.000809
16	0.148950 ± 0.002518	0.146600 ± 0.002501	0.282650 ± 0.003184	0.012900 ± 0.000798
17	0.146500 ± 0.002500	0.144150 ± 0.002484	0.278050 ± 0.003168	0.012600 ± 0.000789
18	0.144700 ± 0.002488	0.141650 ± 0.002466	0.274200 ± 0.003154	0.012150 ± 0.000775
19	0.142400 ± 0.002471	0.139450 ± 0.002450	0.270150 ± 0.003140	0.011700 ± 0.000760
20	0.140450 ± 0.002457	0.137650 ± 0.002436	0.266500 ± 0.003126	0.011600 ± 0.000757
21	0.138900 ± 0.002445	0.135550 ± 0.002420	0.263050 ± 0.003113	0.011400 ± 0.000751
22	0.136500 ± 0.002428	0.133800 ± 0.002407	0.259250 ± 0.003099	0.011050 ± 0.000739
23	0.134350 ± 0.002411	0.131450 ± 0.002389	0.255150 ± 0.003083	0.010650 ± 0.000726
24	0.132550 ± 0.002398	0.129200 ± 0.002372	0.251300 ± 0.003067	0.010450 ± 0.000719
25	0.130400 ± 0.002381	0.127100 ± 0.002355	0.247400 ± 0.003051	0.010100 ± 0.000707
26	0.128400 ± 0.002366	0.124750 ± 0.002337	0.243200 ± 0.003034	0.009950 ± 0.000702
27	0.126200 ± 0.002348	0.122800 ± 0.002321	0.239250 ± 0.003017	0.009750 ± 0.000695
28	0.123500 ± 0.002326	0.120600 ± 0.002303	0.234700 ± 0.002997	0.009400 ± 0.000682
29	0.120450 ± 0.002302	0.118850 ± 0.002288	0.230250 ± 0.002977	0.009050 ± 0.000670
30	0.117200 ± 0.002274	0.115600 ± 0.002261	0.224400 ± 0.002950	0.008400 ± 0.000645
31	0.113800 ± 0.002246	0.113500 ± 0.002243	0.219300 ± 0.002926	0.008000 ± 0.000630
32	0.110150 ± 0.002214	0.110600 ± 0.002218	0.213150 ± 0.002896	0.007600 ± 0.000614
33	0.107350 ± 0.002189	0.107050 ± 0.002186	0.207200 ± 0.002866	0.007200 ± 0.000598
34	0.105150 ± 0.002169	0.103950 ± 0.002158	0.202150 ± 0.002840	0.006950 ± 0.000587

TABLE 1. LUCID efficiency when at least one hit is required on side A (ε^A), on side C (ε^C), either of the sides (ε^{OR}), both sides (ε^{AND}) for pp inelastic collisions and a full ATLAS detector simulation collisions at $\sqrt{s} = 7$ TeV