

| Bulkgrav 74x selections | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 |
|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| entries | 50000 | 50000 | 50000 | 50000 | 48400 | 50000 | 50000 | 50000 | 50000 | 50000 | 50000 |
| nVtx>=1 | 50000 | 50000 | 50000 | 50000 | 48400 | 50000 | 50000 | 50000 | 50000 | 50000 | 50000 |
| triggers | 45552 | 48807 | 49516 | 49782 | 48297 | 49934 | 49954 | 49979 | 49986 | 49996 | 49996 |
| Pt>200GeV and tightId | 45271 | 48700 | 49448 | 49736 | 48256 | 49895 | 49915 | 49942 | 49949 | 49956 | 49959 |
| $ \eta < 2.4$ | 45190 | 48659 | 49405 | 49710 | 48244 | 49881 | 49906 | 49939 | 49945 | 49953 | 49959 |
| $ \Delta\eta < 1.3$ | 40891 | 42500 | 42869 | 42840 | 41794 | 43008 | 43045 | 43227 | 43178 | 43105 | 42942 |
| Mjj>1000 | 17546 | 39660 | 42354 | 42712 | 41761 | 42986 | 43038 | 43226 | 43175 | 43105 | 42942 |
| 105<fatjetPRmassL2L3Corr<135 | 4623 | 11837 | 12139 | 12127 | 11643 | 11717 | 11370 | 10830 | 10310 | 9926 | 9353 |
| τ 2L1 two LP at least one HP | 4586 | 11743 | 12044 | 12046 | 11543 | 11627 | 11263 | 10731 | 10199 | 9786 | 9227 |
| 0-btagged | 5 | 12 | 15 | 13 | 27 | 28 | 62 | 115 | 203 | 345 | 459 |
| 1-btagged | 76 | 217 | 251 | 287 | 370 | 423 | 717 | 1114 | 1565 | 1921 | 2298 |
| 2-btagged | 538 | 1494 | 1657 | 1877 | 2048 | 2384 | 3062 | 3738 | 3932 | 4010 | 3741 |
| 3-btagged | 1736 | 4649 | 4886 | 5079 | 4867 | 4990 | 4782 | 4150 | 3477 | 2837 | 2269 |
| 4-btagged | 2231 | 5371 | 5235 | 4790 | 4231 | 3802 | 2640 | 1614 | 1022 | 673 | 460 |
| HPHP3-btagged | 1529 | 4213 | 4380 | 4557 | 4374 | 4490 | 4197 | 3617 | 2990 | 2370 | 1839 |

Table 1: cutflow.

| Bulkgrav 76x selections | | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 |
|------------------------------------|--|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| entries | | 50000 | 50000 | 50000 | 50000 | 50000 | 50000 | 49200 | 49800 | 0 | 49200 | 48200 |
| nVtx=1 | | 50000 | 50000 | 50000 | 50000 | 50000 | 50000 | 49200 | 49800 | 0 | 49200 | 48200 |
| triggers | | 46278 | 48972 | 49637 | 49854 | 49935 | 49971 | 49190 | 49798 | 0 | 49199 | 48200 |
| Pt>200GeV and tightId | | 45939 | 48823 | 49553 | 49810 | 49890 | 49941 | 49155 | 49761 | 0 | 49150 | 48164 |
| $ \eta < 2.4$ | | 45861 | 48779 | 49517 | 49786 | 49874 | 49931 | 49147 | 49756 | 0 | 49147 | 48164 |
| $ \Delta\eta < 1.3$ | | 41394 | 42694 | 42923 | 42946 | 43218 | 43098 | 42395 | 43108 | 0 | 42391 | 41377 |
| Mjj>1000 | | 14341 | 39304 | 42312 | 42798 | 43157 | 43077 | 42388 | 43107 | 0 | 42391 | 41377 |
| 105<fatjetPRmassL2L3Corr<135 | | 3832 | 11269 | 11431 | 11363 | 11651 | 11414 | 11001 | 10867 | 0 | 9656 | 9093 |
| $\tau 2l_1$ two LP at least one HP | | 3813 | 11185 | 11349 | 11282 | 11574 | 11326 | 10889 | 10762 | 0 | 9535 | 8971 |
| 0-btagged | | 8 | 8 | 16 | 12 | 14 | 15 | 27 | 39 | 0 | 84 | 106 |
| 1-btagged | | 70 | 170 | 175 | 217 | 231 | 296 | 339 | 528 | 0 | 810 | 996 |
| 2-btagged | | 442 | 1284 | 1423 | 1473 | 1573 | 1690 | 1992 | 2428 | 0 | 2844 | 2979 |
| 3-btagged | | 1438 | 4390 | 4560 | 4549 | 4863 | 4696 | 4705 | 4688 | 0 | 3950 | 3417 |
| 4-btagged | | 1855 | 5333 | 5175 | 5031 | 4893 | 4629 | 3826 | 3079 | 0 | 1847 | 1473 |
| HPHP3-btagged | | 1285 | 3983 | 4141 | 4085 | 4346 | 4170 | 4181 | 4118 | 0 | 3398 | 2973 |

Table 2: cutflow.

| Radiation 74x selections | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 |
|------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| entries | 49000 | 50000 | 50000 | 50000 | 50000 | 50000 | 50000 | 50000 | 50000 | 50000 | 50000 |
| nVtx>=1 | 49000 | 50000 | 50000 | 50000 | 50000 | 50000 | 50000 | 50000 | 50000 | 50000 | 50000 |
| triggers | 34242 | 40723 | 43432 | 45162 | 46213 | 47059 | 48162 | 48662 | 49093 | 49267 | 49420 |
| Pt>200GeV and tightId | 33879 | 40435 | 43200 | 44951 | 46013 | 46875 | 47963 | 48417 | 48812 | 48915 | 49008 |
| $ \eta < 2.4$ | 33782 | 40317 | 43093 | 44845 | 45879 | 46744 | 47811 | 48264 | 48643 | 48713 | 48788 |
| $ \Delta\eta < 1.3$ | 27908 | 29747 | 29828 | 29752 | 29790 | 29916 | 29605 | 29479 | 29180 | 29069 | 28946 |
| Mjj>1000 | 11726 | 27193 | 29003 | 29251 | 29439 | 29668 | 29448 | 29403 | 29122 | 29042 | 28927 |
| 105<fatjetPRmassL2L3Corr<135 | 2926 | 7777 | 8131 | 7952 | 8043 | 7872 | 7532 | 7237 | 6928 | 6419 | 6327 |
| τ_{21} two LP at least one HP | 2902 | 7729 | 8068 | 7885 | 7978 | 7796 | 7454 | 7167 | 6845 | 6336 | 6223 |
| 0-btagged | 0 | 8 | 8 | 9 | 17 | 16 | 42 | 69 | 124 | 194 | 307 |
| 1-btagged | 62 | 143 | 175 | 221 | 252 | 295 | 454 | 686 | 973 | 1238 | 1530 |
| 2-btagged | 336 | 980 | 1164 | 1208 | 1432 | 1576 | 2018 | 2380 | 2645 | 2598 | 2588 |
| 3-btagged | 1139 | 2928 | 3236 | 3317 | 3319 | 3277 | 3173 | 2937 | 2392 | 1892 | 1486 |
| 4-btagged | 1365 | 3670 | 3485 | 3130 | 2958 | 2632 | 1767 | 1095 | 711 | 414 | 312 |
| HPHP3-btagged | 1007 | 2625 | 2907 | 2976 | 2960 | 2935 | 2834 | 2589 | 2059 | 1585 | 1204 |

Table 3: cutflow.

| Radiation 76x selections | 1000 | 1200 | 1400 | 1600 | 1800 | 2000 | 2500 | 3000 | 3500 | 4000 | 4500 |
|-----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|
| entries | 50000 | 50000 | 50000 | 49200 | 50000 | 49200 | 49200 | 49200 | 48400 | 0 | 50000 |
| nVtx>=1 | 50000 | 50000 | 50000 | 49200 | 50000 | 49200 | 49200 | 49200 | 48400 | 0 | 50000 |
| triggers | 36068 | 41407 | 44012 | 44881 | 46691 | 46641 | 47684 | 48058 | 47632 | 0 | 49461 |
| Pt>200GeV and tightId | 35450 | 40976 | 43678 | 44531 | 46383 | 46387 | 47418 | 47808 | 47347 | 0 | 49044 |
| $ \eta < 2.4$ | 35356 | 40864 | 43552 | 44430 | 46273 | 46266 | 47305 | 47657 | 47197 | 0 | 48856 |
| $ \Delta\eta < 1.3$ | 28919 | 29885 | 29885 | 29392 | 29942 | 29571 | 29384 | 29075 | 28221 | 0 | 28946 |
| Mjj>1000 | 9648 | 26780 | 28864 | 28818 | 29471 | 29259 | 29188 | 28958 | 28164 | 0 | 28922 |
| 105<fatjetPRmassL2L3Corr<135 | 2494 | 7423 | 7757 | 7613 | 7709 | 7466 | 7445 | 6972 | 6684 | 0 | 6355 |
| τ 2L1 two LP at least one HP | 2480 | 7376 | 7705 | 7553 | 7654 | 7406 | 7372 | 6898 | 6601 | 0 | 6277 |
| 0-btagged | 3 | 5 | 6 | 8 | 12 | 11 | 14 | 14 | 30 | 0 | 73 |
| 1-btagged | 37 | 114 | 120 | 136 | 160 | 181 | 245 | 319 | 430 | 0 | 615 |
| 2-btagged | 305 | 860 | 931 | 1040 | 1101 | 1145 | 1332 | 1561 | 1760 | 0 | 1981 |
| 3-btagged | 937 | 2896 | 3078 | 3002 | 3129 | 3049 | 3214 | 3032 | 2761 | 0 | 2549 |
| 4-btagged | 1198 | 3501 | 3570 | 3367 | 3252 | 3020 | 2567 | 1972 | 1620 | 0 | 1059 |
| HPHP3-btagged | 837 | 2632 | 2787 | 2689 | 2773 | 2735 | 2838 | 2714 | 2429 | 0 | 2184 |

Table 4: cutflow.