

Table 1: Background MC Summary

| Sample Name | xSec(pb) | NEvt | Lumi(pb^{-1}) | k Factor | Weight |
|---------------------------|----------------|--------------------|-------------------|-------------|----------------|
| SingleTs | 3.362 | 622990 | 35866.9 | 1 | 0.193558 |
| SingleTatW | 35.6 | 6.93309e+06 | 35866.9 | 1 | 0.184169 |
| SingleTtW | 35.6 | 6.95283e+06 | 35866.9 | 1 | 0.183646 |
| SingleTat | 80.95 | 3.79043e+07 | 35866.9 | 1 | 0.0765989 |
| SingleTt | 136.02 | 6.72408e+07 | 35866.9 | 1 | 0.0725545 |
| TTJets | 831.76 | 1.53484e+07 | 35866.9 | 1 | 1.9437 |
| WJets | 61526.7 | 8.67318e+07 | 35866.9 | 1.21 | 30.7868 |
| DYJetsToLL10to50 | 18610 | 2.24985e+07 | 35866.9 | 1 | 29.6679 |
| DYJetsToLL50toInf | 5765.4 | 8.17811e+07 | 35866.9 | 1 | 2.52855 |
| TGJets | 2.967 | 368562 | 35866.9 | 1 | 0.288736 |
| TTGJets | 3.697 | 1.57783e+06 | 35866.9 | 1 | 0.0840393 |
| TTWJettlnu | 0.2043 | 1.60353e+06 | 35866.9 | 1 | 0.00456969 |
| TTZJett2l2nu | 0.2529 | 927976 | 35866.9 | 1 | 0.00977477 |
| WW2l2nu | 12.178 | 1.999e+06 | 35866.9 | 1 | 0.218503 |
| WWlnu2q | 49.997 | 8.9978e+06 | 35866.9 | 1 | 0.199298 |
| WZ | 47.13 | 3.87106e+06 | 35866.9 | 1 | 0.436678 |
| ZZ | 16.523 | 1.9881e+06 | 35866.9 | 1 | 0.298089 |
| WWW | 0.2086 | 210538 | 35866.9 | 1 | 0.0355368 |
| WWZ | 0.1651 | 221468 | 35866.9 | 1 | 0.0267381 |
| WZZ | 0.05565 | 216366 | 35866.9 | 1 | 0.00922509 |
| ZZZ | 0.01398 | 213197 | 35866.9 | 1 | 0.00235191 |
| QCDPt80To120EMEnr | 350000 | 3.58418e+07 | 35866.9 | 1 | 350.246 |
| QCDPt120To170EMEnr | 62964 | 3.58173e+07 | 35866.9 | 1 | 63.0513 |
| QCDPt170To300EMEnr | 18810 | 1.15402e+07 | 35866.9 | 1 | 58.4617 |
| QCDPt300ToInfEMEnr | 1350 | 7.37363e+06 | 35866.9 | 1 | 6.56669 |
| QCDPt20ToInfMuEnr | 302672 | 2.20941e+07 | 35866.9 | 1 | 491.35 |