The CMS collaboration reports the production of $W$ bosons decaying to leptons ($W\rightarrow\ell\nu$, $\ell=e,\mu$) using data recorded at the LHC in the 13 TeV energy range. The analysis is performed using the BDT (Boosted Decision Trees) algorithm and includes contributions from EW W+jets, $t\bar{t}$, QCD, and interference processes.

For the $W\rightarrow\mu\nu$ channel, the data is shown as red bars, with contributions from EW W+jets (green), W+jets (light green), $t\bar{t}$ (blue), and QCD (purple). The data is normalized to 35.9 fb$^{-1}$ and the distributions are plotted for $N_{SAjet} \cdot p_T > 2$ GeV, with a comparison to the PYTHIA PS predictions.

Similarly, for the $W\rightarrow e\nu$ channel, the data is shown as red bars, with contributions from EW W+jets (green), W+jets (light green), $t\bar{t}$ (blue), and QCD (purple). The data is normalized to 35.9 fb$^{-1}$ and the distributions are plotted for $N_{SAjet} \cdot p_T > 2$ GeV, with a comparison to the PYTHIA PS predictions.

The plots show the ratio of data to prediction, with error bars indicating the statistical uncertainty.