Observation of same-sign $WW$ production from double parton scattering in proton-proton collisions at $\sqrt{s} = 13$ TeV

—Supplemental Material—

Distributions of the kinematic variables used to train the BDT discriminants along with the two BDT discriminants

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(Dated: August 17, 2022)
FIG. 1. Distributions of the kinematic variables used for the training of the BDT discriminants for the combined $e^\pm\mu^\pm$ and $\mu^\pm\mu^\pm$ final states: $p_T^{f_1}, p_T^{f_2}, p_T^{\text{miss}}, m_T^2(\ell\ell), m_T(\ell_1, p_T^{f_2}), |\Delta \phi (\ell_1, p_T^{f_2})|, |\Delta \phi (f_2, p_T^{\text{miss}})|, |\Delta \phi (\ell_2, f_2)|, \eta^{f_1} \times \eta^{f_2}$, and $|\eta^{f_1} + \eta^{f_2}|$. The signal and background yields have been normalized to their respective postfit yields. The uncertainty bands represent the total expected uncertainty on the predicted yields, which includes both the statistical and systematic components.
FIG. 2. Distributions of the two single BDT discriminants for the combined $e^{\pm}\mu^{\pm}$ and $\mu^{\pm}\mu^{\pm}$ final states. The BDT discriminant trained against the $WZ$ (nonprompt leptons) background is labeled as BDT$_{WZ}$ (BDT$_{\text{nonprompt}}$). The signal and background yields have been normalized to their respective postfit yields. The uncertainty bands represent the total expected uncertainty on the predicted yields, which includes both the statistical and systematic components.