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Data-Driven Background Estimation for ttH(H→bb̄) in the Dilepton Channel with CMS

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Prospects for the measurement of top quark–antiquark associated Higgs boson production ($t\bar{t}H$) in Run 3 and the HL-LHC era are presented. The study is performed in the opposite-sign dilepton channel, focusing on the Higgs boson decay to bottom quarks ($H \to b\bar{b}$). A novel approach is introduced, and projection studies for the HL-LHC are explored. The analysis strategy relies on a data-driven method, the Tag Rate Function, to estimate the dominant background contribution from $t\bar{t}$ events. Improvements in the analysis are also investigated by applying the Run 3 tagging algorithm to simulated events.

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