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Precise predictions for $b\bar{b}H$ production at the LHC

With the growing precision of experimental measurements, combining fixed-order perturbative calculations with parton-shower effects becomes essential for an accurate description of LHC phenomenology. In this talk, we present novel calculations of Higgs production in association with bottom quarks ($b\bar{b}H$), computed at NNLO accuracy and matched to parton showers (NNLO+PS), using the MiNNLOPS method. We consider both the five-flavor scheme (5FS) with massless bottom quarks and the four-flavor scheme (4FS) with massive bottom quarks. We provide a detailed comparison of the two schemes and their respective predictions. And we show that NNLO corrections in the 4FS solve the long-standing issue of discrepancies between 4FS and 5FS predictions. Possible approaches to consistently combine 4FS and 5FS NNLO+PS predictions in the future at the fully exclusive level will also be discussed.

Secondary track

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