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Complementary constraints on Zbb couplings at the LHC

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As one of those long-standing experimental anomalies from the LEP era, albeit mild, the discrepancy to the standard model prediction in the $Zb\bar{b}$ coupling keeps drawing attention over the years as the LHC accumulates data. So far, differential data and studies from electroweak production of the bb pair and other potentially sensitive channels at the LHC and LHCb are yet to become competitive with the existing Z-pole measure from LEP. We propose in this study to look at another LHC signal, the $b\bar{b}+Z/\gamma(\to \ell\ell)$ associated production, both on and off-Z-mass-shell region. The varying dependence on the concerned couplings through interplay of Z and photon interference pattern in the $b\bar{b}\ell\ell$ final states offer distinct constraint power.

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