

Higgs decay into a lepton pair and a photon revisited

Wednesday 29 July 2020 17:36 (18 minutes)

We present new calculations of the differential decay rates for $H \rightarrow \ell^+ \ell^- \gamma$ with $\ell = e$ or μ in the Standard Model. The branching fractions and forward-backward asymmetries, defined in terms of the flight direction of the photon relative to the lepton momenta, depend on the cuts on energies and invariant masses of the final state particles.

For typical choices of these cuts we find the branching ratios

$B(H \rightarrow e\bar{e}\gamma) = 6.1 \cdot 10^{-5}$ and $B(H \rightarrow \mu\bar{\mu}\gamma) = 6.7 \cdot 10^{-5}$ and the forward-backward asymmetries

$\mathcal{A}_{\text{FB}}^{(e)} = 0.366$ and

$\mathcal{A}_{\text{FB}}^{(\mu)} = 0.280$.

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Secondary track (number)

04.

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Session Classification: Higgs Physics

Track Classification: 01. Higgs Physics