

# The bottom quark mass from Higgs measurements

*Tuesday, November 8, 2022 12:10 PM (15 minutes)*

The measurement of the  $H \rightarrow b\bar{b}$  decay rate by ATLAS and CMS offers an opportunity to test the scale evolution or “running” of the bottom quark mass. With an excellent mass sensitivity, reduced dependence on  $\alpha_s$  and a clearly identifiable scale, the Higgs decay process is the ideal laboratory to extract a high-scale quark mass. The mass at the scale given by the Higgs boson mass,  $m_b(m_H)$  is determined to be  $2.6 \pm 0.3$  GeV. Combining this new measurement with the determination of  $m_b(m_b)$  from low-energy data and  $m_b(m_Z)$  from LEP and SLD measurements at the Z-pole, we revisit the scale evolution of the bottom quark mass, finding an unambiguous confirmation of this SM prediction. The result from PRL128 (2021) is updated with the latest results by ATLAS and CMS and projections of the future precision at the HL-LHC and a future Higgs/top/EW factory are presented.

## Type of talk

Experimental measurements

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