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The bottom quark mass at high scale

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Measurements at electron-positron colliders can probe the scale evolution of quark masses predicted by the Standard Model in several ways. LEP and SLD extracted $m_b(m_Z)$ from three jet rates in $Z \rightarrow b\bar{b}$ decay. A future Z-pole run can improve the precision considerably, while a measurement of m_b at higher scale is possible from $e^+e^- \rightarrow b\bar{b}$ production at 250 GeV and above. A very precise determination of $m_b(m_H)$, with an uncertainty of 10s of MeV, can be achieved from measurements of Higgs decay rates in the Higgs factory runs at $\sqrt{s} = 250$ GeV and 550 GeV. In this contribution, we improve the extraction of $m_b(m_H)$ using LHC data and provide updated projections for the HL-LHC and future colliders, adopting the most recent scenarios.

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