

Measurement of the Z-boson mass

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The first dedicated Z-boson mass measurement at the LHC with $Z \rightarrow \mu^+\mu^-$ decays is reported. The dataset uses proton-proton collisions at a centre-of-mass energy of 13 TeV, recorded in 2016 by the LHCb experiment, and corresponds to an integrated luminosity of 1.7 fb^{-1} . A template fit to the $\mu^+\mu^-$ mass distribution yields the following result for the Z-boson mass,

$$m_Z = 91184.2 \pm 8.5 \pm 3.8 \text{ MeV},$$

where the first uncertainty is statistical and the second systematic. This result is consistent with previous measurements and predictions from global electroweak fits.

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