The $e^+e^- \to \mu^+\mu^-$ at Cross Section in the Standard Model

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Abstract

The Standard Model's (SM) prediction of particles beyond those initially considered by quantum electrodynamics (QED) will soon by tested in the Super Proton Synchrotron (SPS) at CERN. SPS will attempt Z production via the $p\bar{p}$ mechanism. We performed a numerical integration of the differential cross section of the $e^+e^- \to \mu^+\mu^-$ scattering process which may produce new Z bosons in the hope that the proposed Large Electron-Position collider (LEP) will verify this channel of Z production. A distinct Z resonance around the proposed Z mass of 91.8GeV was found with a cross section $\sigma = 9.4\text{nb}^{-1}$.

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