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Prospective Studies for LEP3 with the CMS Detector

On July 4, 2012, the discovery of a new boson, with mass around $125\sqrt{\text{GeV}/c^2}$ and with properties compatible with those of a standard-model Higgs boson, was announced at CERN. In this context, a high-luminosity electron-positron collider ring, operating in the LHC tunnel at a centre-of-mass energy of 240 GeV and called LEP3, becomes an attractive opportunity both from financial and scientific point of views. The performance and the suitability of the CMS detector are evaluated, with emphasis on an accurate measurement of the Higgs boson properties. The precision expected for the Higgs boson couplings is found to be substantially better than that predicted by Linear Collider studies.

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