



Extrait du Laboratoire Leprince-Ringuet

<http://polywww.in2p3.fr/spip.php?article1727>

# Observation of a New Particle with a Mass of 125 GeV.

- In the headlines -

Date de mise en ligne : Wednesday 11 July 2012

## **Description :**

In a joint seminar today at CERN and the "ICHEP 2012" conference in Melbourne, researchers of the Compact Muon Solenoid (CMS) experiment at the Large Hadron Collider (LHC) presented their preliminary results on the search for the standard model (SM) Higgs boson in their data recorded up to June 2012.

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**Laboratoire Leprince-Ringuet**

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## Observation of a New Particle with a Mass of 125 GeV.

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## Summary

In a joint seminar today at CERN and the "ICHEP 2012" conference in Melbourne, researchers of the Compact Muon Solenoid (CMS) experiment at the Large Hadron Collider (LHC) presented their preliminary results on the search for the standard model (SM) Higgs boson in their data recorded up to June 2012.

CMS observes an excess of events at a mass of approximately 125 GeV with a statistical significance of five standard deviations (5 sigma) above background expectations. The probability of the



background alone fluctuating up by this amount or more is about one in three million. The evidence is strongest in the two final states with the best mass resolution: first the two-photon final state and second the final state with two pairs of charged leptons (electrons or muons). We interpret this to be due to the production of a previously unobserved particle with a mass of around 125 GeV.

The CMS data also rule out the existence of the SM Higgs boson in the ranges 110-122.5 GeV and 127-600 GeV with 95% confidence level &ndash; lower masses were already excluded by CERN's LEP collider at the same confidence level.

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## Observation of a New Particle with a Mass of 125 GeV.

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**<span lang="EN-US" style="mso-bidi-font-size: 11.0pt;mso-bidi-font-family:"Times New Roman"">Within the statistical and systematic uncertainties, results obtained in the various search channels are consistent with the expectations for the SM Higgs boson. However, more data are needed to establish whether this new particle has all the properties of the SM Higgs boson or whether some do not match, implying new physics beyond the standard model.**

**<span lang="EN-US" style="mso-bidi-font-size: 11.0pt;mso-bidi-font-family:"Times New Roman"">The LHC continues to deliver new data at an impressive rate. By the end of 2012, CMS hopes to have more than triple its total current data sample. These data will enable CMS to elucidate further the nature of this newly observed particle. They will also allow CMS to extend the reach of their many other searches for new physics.<span lang="EN-US" style="mso-bidi-font-size: 11.0pt;mso-bidi-font-family:"Times New Roman"">**

