

LHC experiments eliminate more Higgs hiding spots (Update)

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(PhysOrg.com) -- Two experimental collaborations at the Large Hadron Collider, located at CERN laboratory near Geneva, Switzerland, announced today that they have significantly narrowed the mass region in which the Higgs boson could be hiding.

The ATLAS and CMS experiments excluded with 95 percent certainty the existence of a Higgs over most of the mass region from 145 to 466 GeV. They announced the new results at the biennial Lepton-Photon conference, held this year in Mumbai, India.

“Each time we add new data to our analyses, we close in more on where the Higgs might be hiding,” said Darin Acosta, a University of Florida professor and deputy physics coordinator for the CMS experiment.

More than 1,700 scientists, engineers and graduate students from the United States collaborate on the experiments at the LHC, most of them on the CMS and ATLAS experiments, through funding by the Department of Energy Office of Science and the National Science Foundation. Brookhaven National Laboratory serves as the U.S. base for participation in the ATLAS experiment, and Fermi National Accelerator Laboratory serves as the U.S. base for participation in the CMS experiment.

The Higgs particle is the last not-yet-observed piece of the theoretical framework known as the Standard Model of particles and forces. According to the [Standard Model](#), the [Higgs boson](#) explains why some

particles have mass and others do not.

“The more data the experiments collect, the more scientists can say with greater statistical certainty,” said Konstantinos Nikolopoulos, a physicist at Brookhaven National Laboratory on the ATLAS experiment. “The LHC has been providing that data at an impressive rate. The machine has been functioning beyond expectations.”

Scientists on ATLAS and CMS both announced seeing small, possible hints of the Higgs boson at the European Physical Society meeting in July. Those hints have become less pronounced as scientists have increased the amount of data in their analysis.

“These are exciting times for [particle physics](#),” said [CERN](#)’s research director, Sergio Bertolucci. “Discoveries are almost assured within the next twelve months. If the Higgs exists, the LHC experiments will soon find it. If it does not, its absence will point the way to new physics.”

The experiments are on track to at least double the amount of data they have collected by the end of the year.

More information: Further information about the Lepton Photon conference: www.tifr.res.in/~lp11/

Provided by CERN

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