



EP Seminar

SPEAKER: Gregorio Bernardi (LPNHE Paris 6 and 7)

TITLE: **Evidence for a particle produced in association with weak bosons and decaying to a bottom-antibottom quark pair in Standard Model Higgs search at the Tevatron.**

DATE: Tue 31/07/2012 11:00

PLACE: Council Chamber

ABSTRACT

We combine results from the CDF and D0 Collaborations on direct searches for the standard model (SM) Higgs boson (H) in ppbar collisions at the Fermilab Tevatron, using 10 fb⁻¹ of data. Searches are carried out for Higgs boson masses between 100 and 200 GeV. There is a significant excess of data events with respect to the background estimation in the mass range $115 < m_H < 135$ GeV, consistent with the Higgs-like particle recently observed by ATLAS and CMS.

At $m_H = 120$ GeV, the p-value for a background fluctuation to produce this excess corresponds to a local (global) significance of 3.0 (2.5) standard deviations. We also combine separately searches for $H \rightarrow b\bar{b}$ and $H \rightarrow WW$. We find that the excess is concentrated in the $H \rightarrow b\bar{b}$ channel, appearing in the searches over a broad range of m_H , as expected from the $b\bar{b}$ resolution in our detectors. The excess is most significant in the mass range between 120 and 135 GeV. The largest local significance is 3.3 standard deviations, corresponding to a global significance of 3.1 standard deviations. We interpret this as evidence for the presence of a new particle consistent with the standard model Higgs boson, which is produced in association with a weak vector boson and decays to a bottom-antibottom quark pair.