Copyright and Content

Tim SMITH

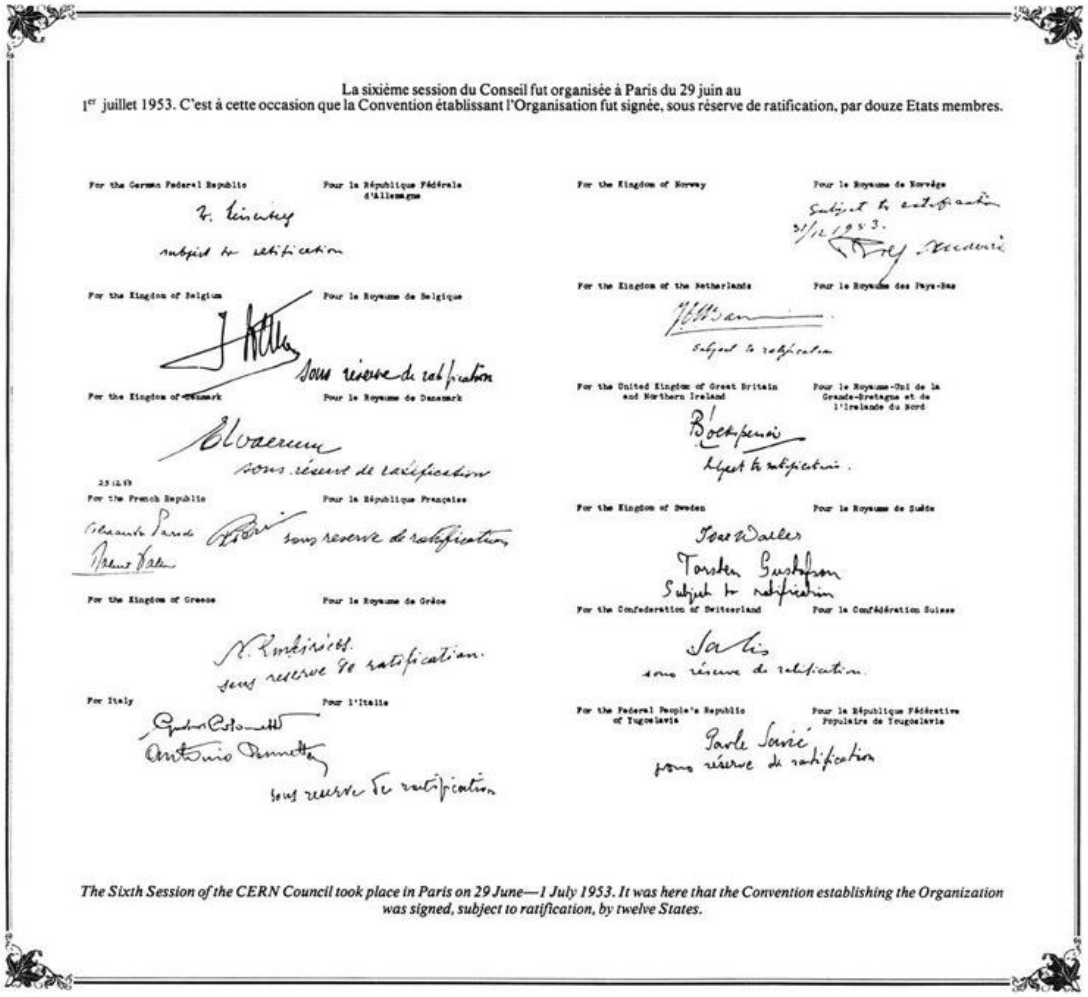
Invenio User Group Workshop,
CERN, Oct 2015

A Visionary Perspective

Open Access Enshrined in our Convention

"The results of [CERN's] experimental and theoretical work shall be published or otherwise made generally available"

CERN Convention, Article II.1, 1953



La sixième session du Conseil fut organisée à Paris du 29 juin au 1er juillet 1953. C'est à cette occasion que la Convention établissant l'Organisation fut signée, sous réserve de ratification, par douze Etats membres.

The Sixth Session of the CERN Council took place in Paris on 29 June—1 July 1953. It was here that the Convention establishing the Organization was signed, subject to ratification, by twelve States.

What's best for Open Science?

Copyright

Public Domain

Intellectual Property: Copyright

- Automatic – don't need to claim – and Exclusive
  - Moral
    - To claim authorship
  - Economic
    - To exploit the work
- To make "Open", need to waive or licence
- Key points in question…
  - Credit and Appropriation
  - Intrinsic value of original or derivative work?

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  - Avoid transfer of ownership
    - e.g.: Publications Policy: *"CERN will strive to exercise its copyright in such a way as to permit the widest possible dissemination and use of the paper. Every reasonable effort will be made to avoid transfer of copyright to a third party."*
  - CERN may hold IP for the benefit of a collaboration
- License openly
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- Highlight special IGO status without modifying licence
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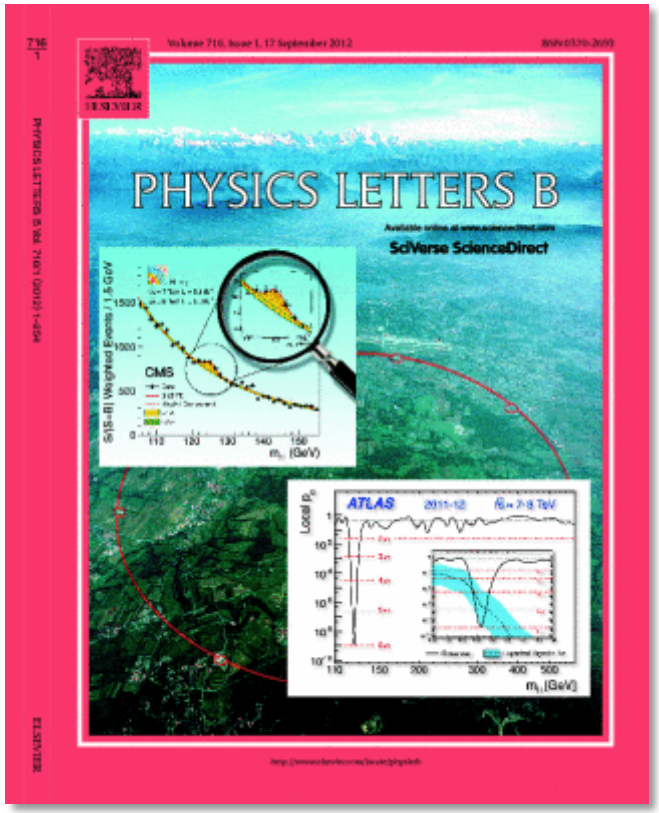
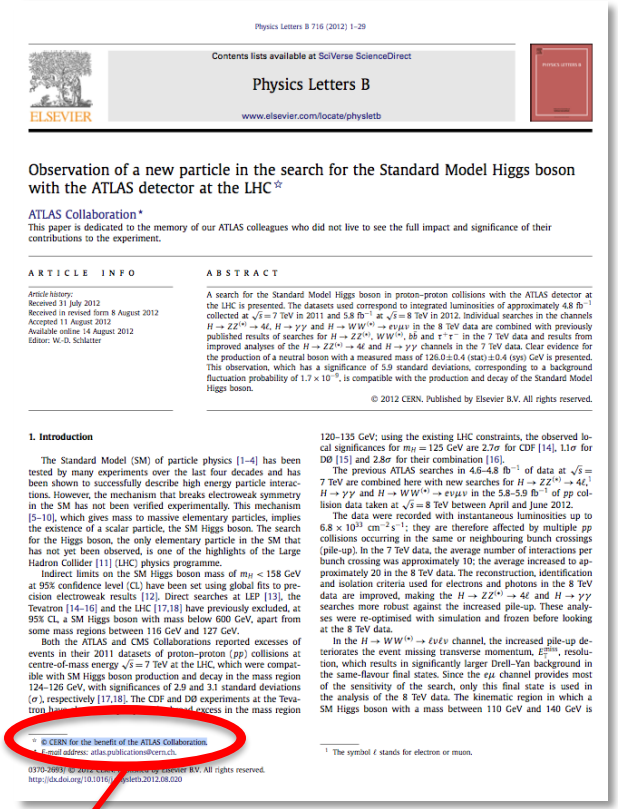
Publications





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Physics Letters B

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Observation of a new particle in the search for the Standard Model Higgs boson with the ATLAS detector at the LHC ☆

ATLAS Collaboration *

This paper is dedicated to the memory of our ATLAS colleagues who did not live to see the full impact and significance of their contributions to the experiment.

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ABSTRACT

A search for the Standard Model Higgs boson in proton–proton collisions with the ATLAS detector at the LHC is presented. The datasets used correspond to integrated luminosities of approximately 4.8 fb^{-1} collected at $\sqrt{s} = 7$ TeV in 2011 and 5.8 fb^{-1} at $\sqrt{s} = 8$ TeV in 2012. Individual searches in the channels $H \to ZZ^{(*)} \to 4\ell$, $H \to \gamma\gamma$ and $H \to WW^{(*)} \to e\nu\mu\nu$ in the 8 TeV data are combined with previously published results of searches for $H \to ZZ^{(*)}$, $WW^{(*)}$, $b\bar{b}$ and $\tau^+\tau^-$ in the 7 TeV data and results from improved analyses of the $H \to ZZ^{(*)} \to 4\ell$ and $H \to \gamma\gamma$ channels in the 7 TeV data. Clear evidence for the production of a neutral boson with a measured mass of 126.0±0.4 (stat)±0.4 (sys) GeV is presented. This observation, which has a significance of 5.9 standard deviations, corresponding to a background fluctuation probability of 1.7×10^{-9}, is compatible with the production and decay of the Standard Model Higgs boson.

1. Introduction

The Standard Model (SM) of particle physics [1–4] has been tested by many experiments over the last four decades and has been shown to successfully describe high energy particle interactions. However, the mechanism that breaks electroweak symmetry in the SM has not been verified experimentally. This mechanism [5–10], which gives mass to massive elementary particles, implies the existence of a scalar particle, the SM Higgs boson. The search for the Higgs boson, the only elementary particle in the SM that has not yet been observed, is one of the highlights of the Large Hadron Collider [11] (LHC) physics programme.

Indirect limits on the SM Higgs boson mass of $m_H < 158$ GeV at 95% confidence level (CL) have been set using global fits to precision electroweak results [12]. Direct searches at LEP [13], the Tevatron [14–16] and the LHC [17,18] have previously excluded, at 95% CL, a SM Higgs boson with mass below 600 GeV, apart from some mass regions between 116 GeV and 127 GeV.

Both the ATLAS and CMS Collaborations reported excesses of events in their 2011 datasets of proton–proton (pp) collisions at centre-of-mass energy $\sqrt{s} = 7$ TeV at the LHC, which were compatible with SM Higgs boson production and decay in the mass region 124–126 GeV, with significances of 2.9 and 3.1 standard deviations (σ), respectively [17,18]. The CDF and DØ experiments at the Tevatron have reported [redacted] excess in the mass region 120–135 GeV; using the existing LHC constraints, the observed local significances for $m_H = 125$ GeV are 2.7σ for CDF [14], 1.1σ for DØ [15] and 2.8σ for their combination [16].

The previous ATLAS searches in 4.6–4.8 fb^{-1} of data at $\sqrt{s} = 7$ TeV are combined here with new searches for $H \to ZZ^{(*)} \to 4\ell$,[1] $H \to \gamma\gamma$ and $H \to WW^{(*)} \to e\nu\mu\nu$ in the 5.8–5.9 fb^{-1} of pp collision data taken at $\sqrt{s} = 8$ TeV between April and June 2012.

The data were recorded with instantaneous luminosities up to 6.8×10^{33} cm^{-2} s^{-1}; they are therefore affected by multiple pp collisions occurring in the same or neighbouring bunch crossings (pile-up). In the 7 TeV data, the average number of interactions per bunch crossing was approximately 10; the average increased to approximately 20 in the 8 TeV data. The reconstruction, identification and isolation criteria used for electrons and photons in the 8 TeV data are improved, making the $H \to ZZ^{(*)} \to 4\ell$ and $H \to \gamma\gamma$ searches more robust against the increased pile-up. These analyses were re-optimised with simulation and frozen before looking at the 8 TeV data.

In the $H \to WW^{(*)} \to \ell\nu\ell\nu$ channel, the increased pile-up deteriorates the event missing transverse momentum, E_T^{miss}, resolution, which results in significantly larger Drell–Yan background in the same-flavour final states. Since the $e\mu$ channel provides most of the sensitivity of the search, only this final state is used in the analysis of the 8 TeV data. The kinematic region in which a SM Higgs boson with a mass between 110 GeV and 140 GeV is

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[redacted]

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[1] The symbol ℓ stands for electron or muon.

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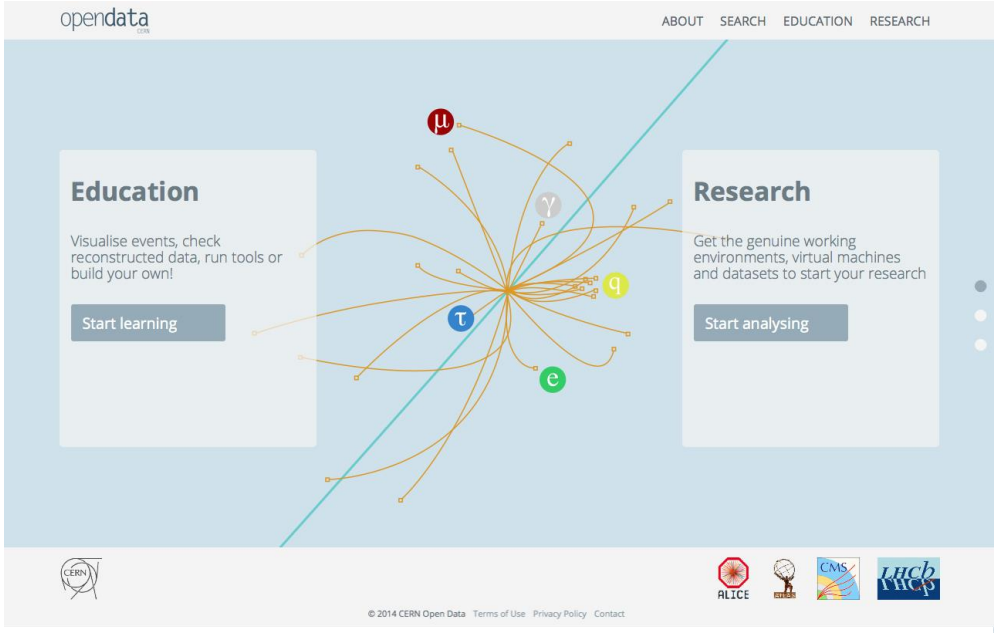
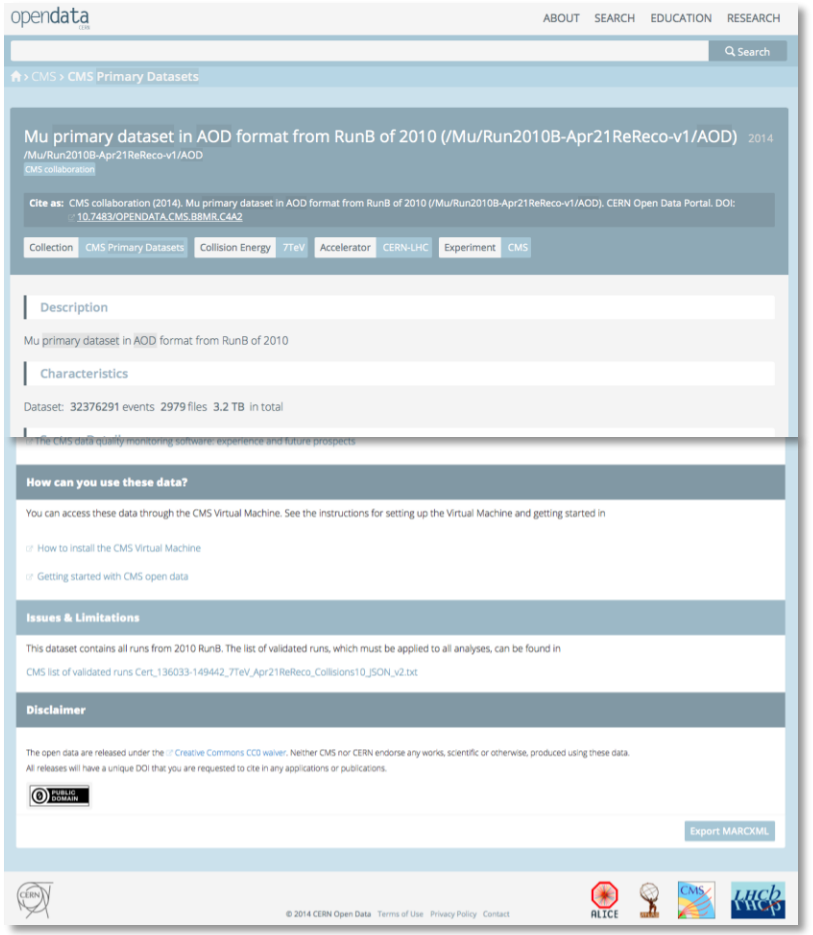
- CERN Library Bibliographic Data
- CERN Book Catalogue

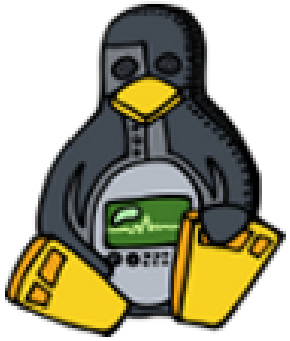
- LHC Open Data





Hardware

- CERN–OHL is to hardware what GPL is to software
  - *“anyone should be able to see the source (the design documentation in case of hardware), study it, modify it and share it”*

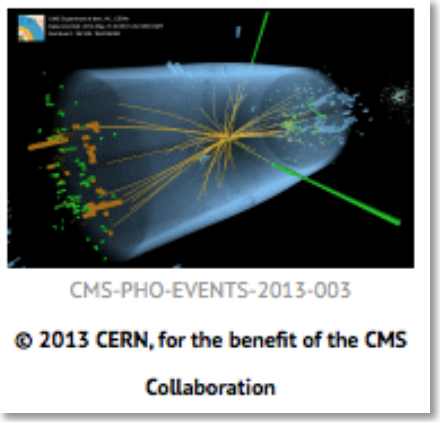


open source hardware

- http://www.ohwr.org/projects/cernohl/wiki
- http://freedomdefined.org/OSHW

MultiMedia

- CERN Terms of Use – open/special
- CC for Higgs boson Nobel Day



CMS-PHO-EVENTS-2013-003

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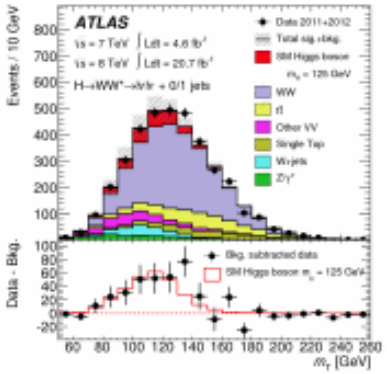

ATLAS-PHO-EVENTS-2013-003

ATLAS Experiment © 2013 CERN

Aerial View of the CERN taken in 2008.

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Rolf-Dieter Heuer

From Wikipedia, the free encyclopedia

Professor **Rolf-Dieter Heuer** (German: [ʁɔlf ˈdiːtɐ ˈhɔʏɐ]; born 24 May 1948 in Boll) is a German particle physicist and the Director General of CERN since 2009.[1][2]

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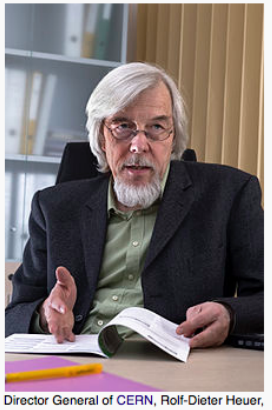
Biography [edit]

Heuer studied physics at the University of Stuttgart. He then obtained his PhD 1977 at the University of Heidelberg under Joachim Heintze for his study of neutral decay modes of the Ψ(3686).

His post-doc studies include the JADE experiment at the electron-positron storage ring PETRA at DESY, and from 1984, at the OPAL experiment at CERN, where he also became spokesperson of the OPAL collaboration for many years.

Having been offered a full professorship for experimental physics at the University of Hamburg, Heuer returned to DESY in 1998. In 2004, he was appointed DESY's Research Director.

Rolf-Dieter Heuer



Director General of CERN, Rolf-Dieter Heuer, upon taking up office in 2009

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Conclusions

- Copyright: for Good!
- Licence: clear and usable