CERN Open Data Portal

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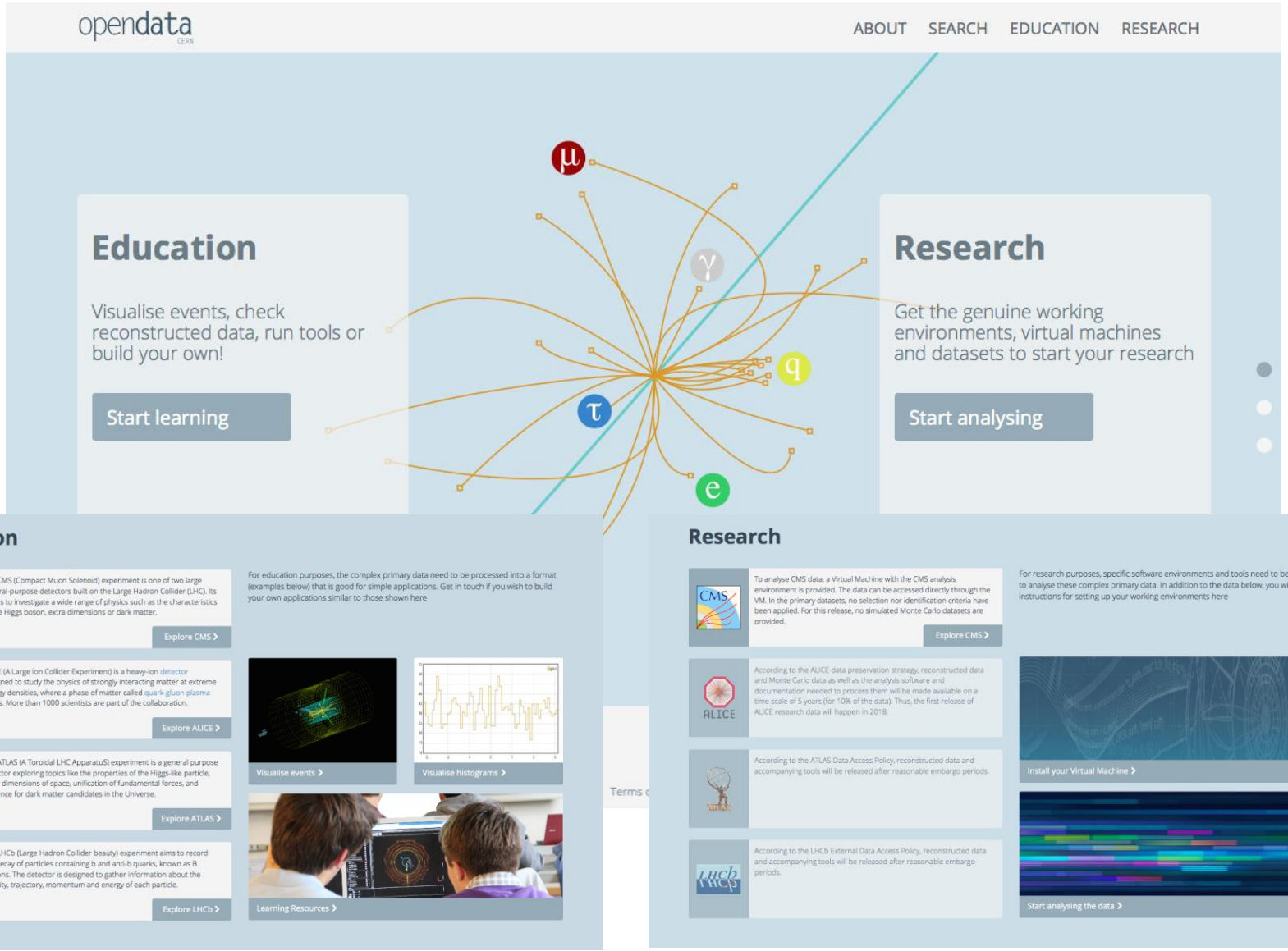
DPHEP Workshop, June 2016

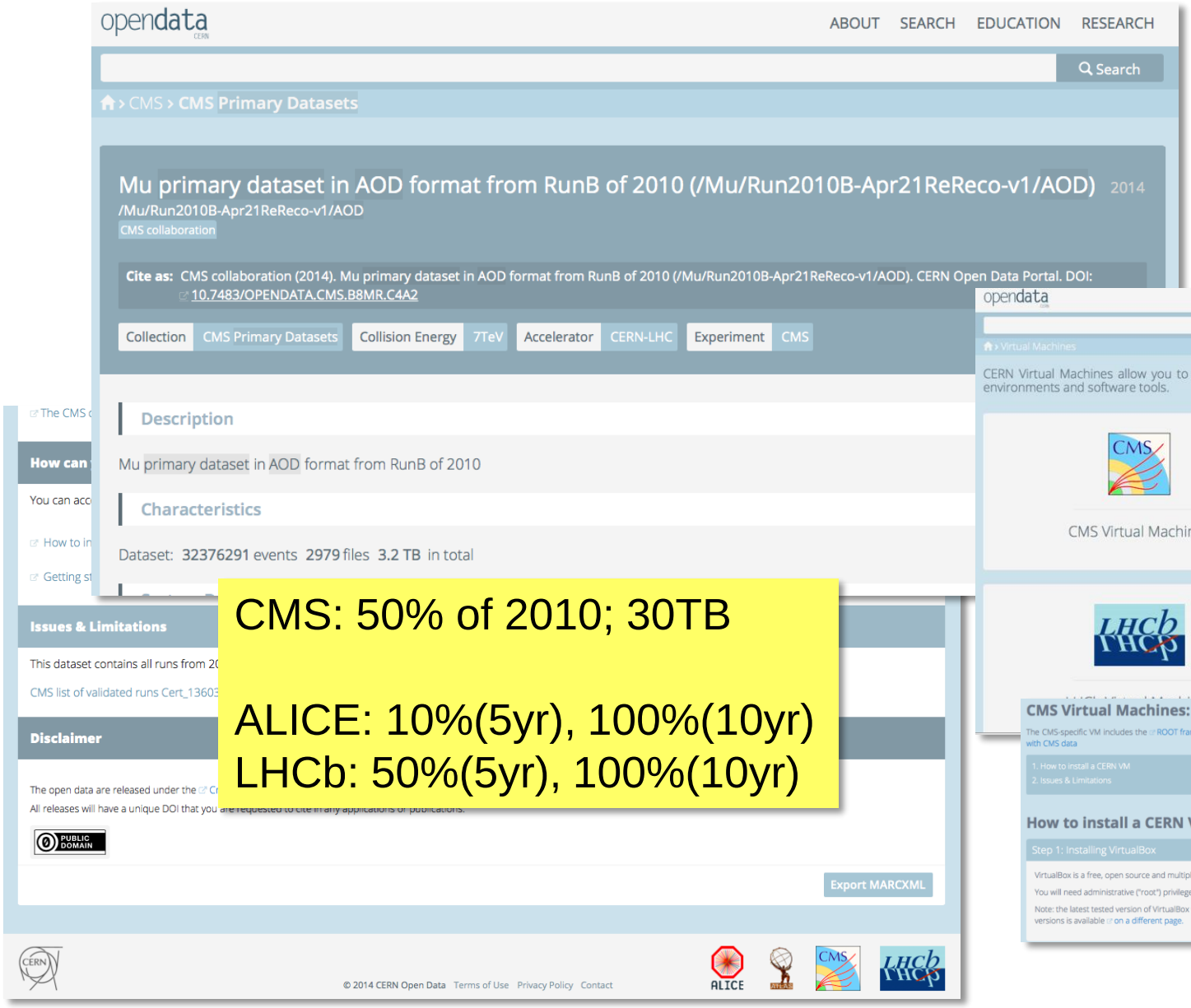
Open Data Portal



Timeline

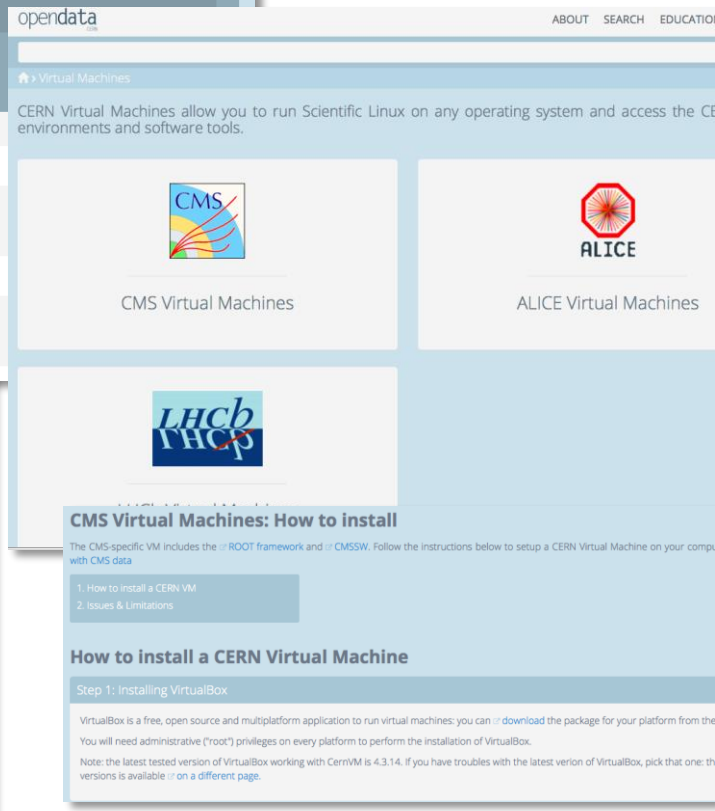
- **November 2014** Initial release
  - ALICE: educational datasets, modules, VM
  - ATLAS: masterclass datasets
  - CMS: primary datasets (30 TB of 2010), educational data sets, analysis example and software, VM, event display, histogramming
  - LHCb: masterclass datasets, VM
- **February 2015** ATLAS update
  - ATLAS: addition of enhanced Kaggle ML challenge datasets, software, documentation
- **May 2015** ALICE update
  - ALICE: addition of ESD datasets (10 TB of 2010)

L3: Reconstructed Data

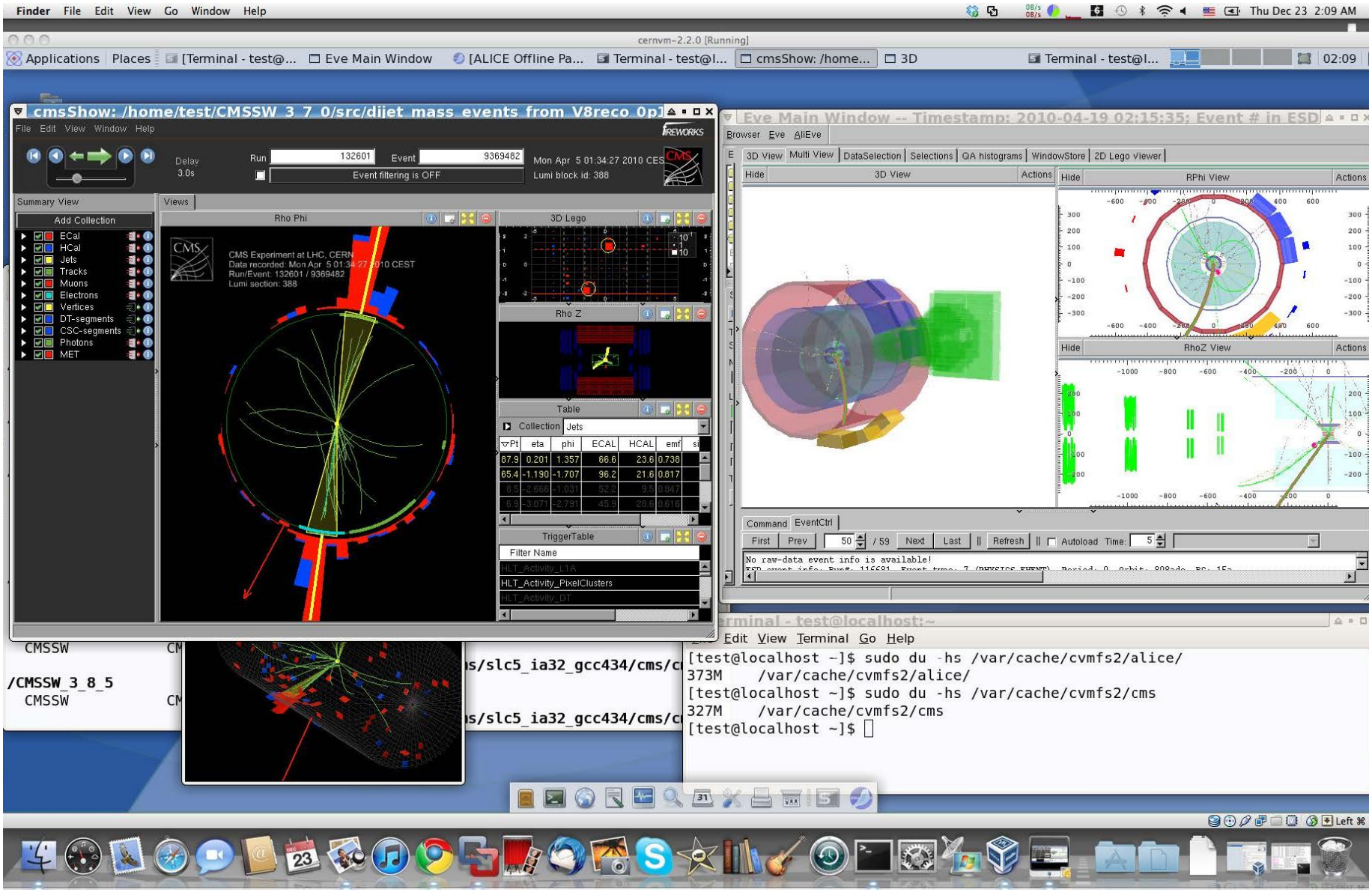


CMS: 50% of 2010; 30TB

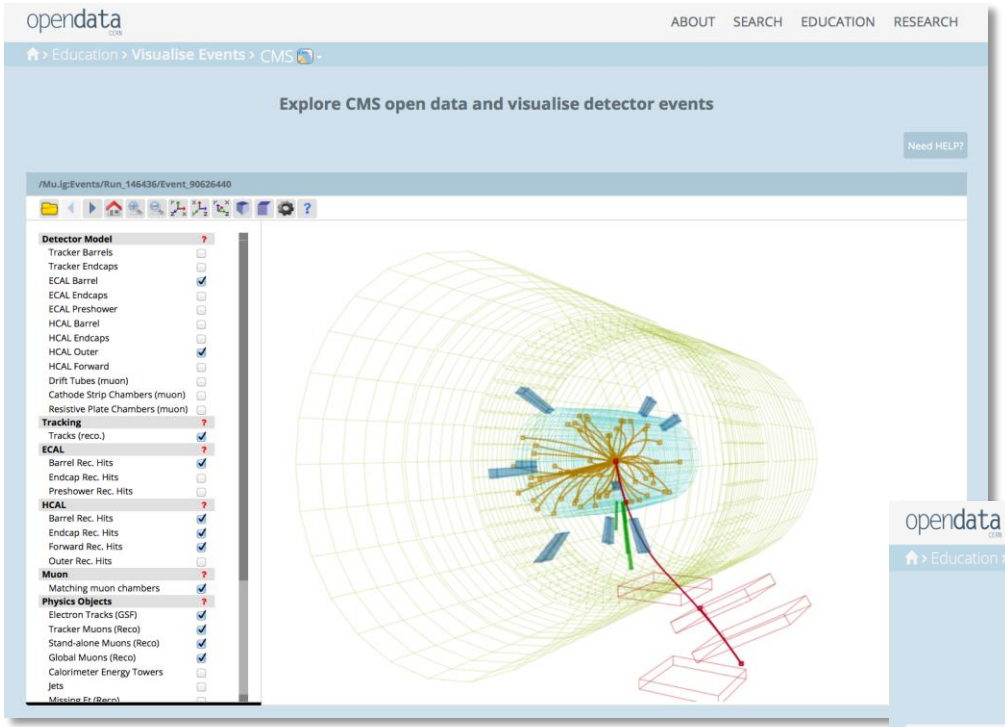
ALICE: 10%(5yr), 100%(10yr)
LHCb: 50%(5yr), 100%(10yr)



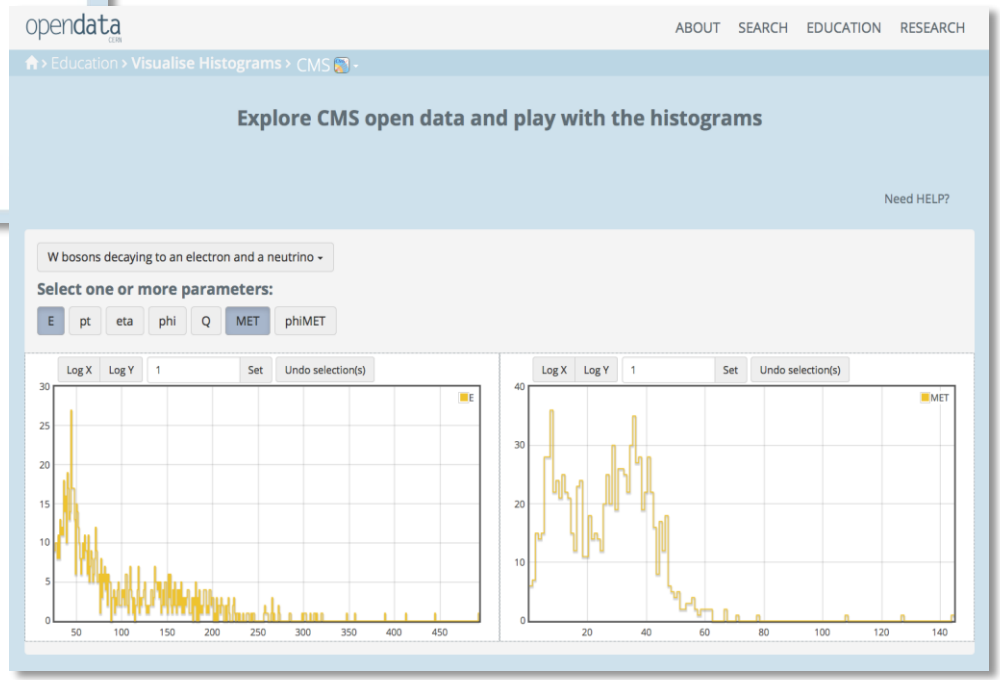
Virtual Machines: CernVM



L2: Outreach and Education



Visualise detector events



Basic Histogramming

L2: Higgs Kaggle Challenge

opendata

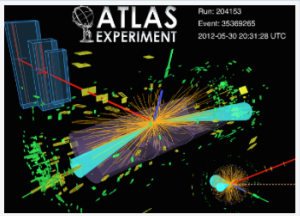
ABOUT SEARCH EDUCATION RESEARCH

Search

ATLAS Higgs Challenge 2014

gs boson was announced July 4, 2012 and
13 saw a number of prestigious awards,
physicists, the discovery of a new particle
difficult quest to measure its characteristics
model of nature.

w often it decays into other particles. ATLAS is
g place at the Large Hadron Collider at CERN
and processes using head-on collisions of
nergy. The ATLAS experiment has recently
son decaying into two tau particles, but this
kground noise.



ine Learning Challenge is to explore the potential of advanced machine learning methods to
of the experiment. No knowledge of particle physics is required. Using simulated data with
ected by ATLAS, your task is to classify events into "tau tau decay of a Higgs boson" versus

le platform from May to September 2014, drawing more that 1700 participants. Very promising

kaggle

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Higgs challenge

Completed • $13,000 • 1,785 teams

Higgs Boson Machine Learning Challenge

Mon 12 May 2014 – Mon 15 Sep 2014 (8 months ago)

Dashboard

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Forum

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- Public
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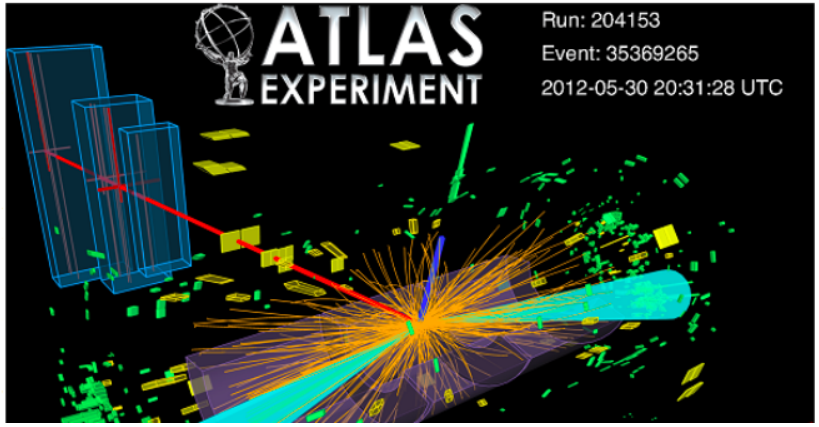
Leaderboard

1. Gábor Melis
2. Tim Salimans

Competition Details » Get the Data » Make a submission

Use the ATLAS experiment to identify the Higgs boson



Dataset Semantics

EventId: An unique integer identifier of the event.
DER_mass_MMC: The estimated mass m_H of the Higgs boson candidate, obtained through a pr
integration.
DER_mass_transverse_met_lep: The transverse mass between the missing transverse energy an
DER_mass_vis: The invariant mass of the hadronic tau and the lepton.
DER_pt_h: The modulus of the vector sum of the transverse momentum of the hadronic tau, the le
transverse energy vector.
DER_deltaeta_jet_jet: The absolute value of the pseudorapidity separation between the two jets (
$\leq$ 1).
DER_mass_jet_jet: The invariant mass of the two jets (undefined if PRI_jet_num $\leq$ 1).
DER_prodeta_jet_jet: The product of the pseudorapidities of the two jets (undefined if PRI_jet_nu
DER_deltar_tau_lep: The R separation between the hadronic tau and the lepton.
DER_pt_tot: The modulus of the vector sum of the missing transverse momenta and the transvers
hadronic tau, the lepton, the leading jet (if PRI_jet_num $\geq$) and the subleading jet (if PRI jet num =
additional jets).
DER_sum_pt: The sum of the moduli of the transverse momenta of the hadronic tau, the lepton, t
num $\geq$ 1) and the subleading jet (if PRI jet num = 2) and the other jets (if PRI jet num = 3).
DER_pt_ratio_lep_tau: The ratio of the transverse momenta of the lepton and the hadronic tau.
DER_met_phi_centrality: The centrality of the azimuthal angle of the missing transverse energy v
tau and the lepton.
DER_lep_eta_centrality: The centrality of the pseudorapidity of the lepton w.r.t. the two jets (und
1).
PRI_tau_pt: The transverse momentum $\sqrt{p_x^2 + p_y^2}$ of the hadronic tau.
PRI_tau_eta: The pseudorapidity η of the hadronic tau.
PRI_tau_phi: The azimuth angle ϕ of the hadronic tau.
PRI_lep_pt: The transverse momentum $\sqrt{p_x^2 + p_y^2}$ of the lepton (electron or muon).
PRI_lep_eta: The pseudorapidity η of the lepton.
PRI_lep_phi: The azimuth angle ϕ of the lepton.
PRI_met: The missing transverse energy $\vec{E}_T^{miss}$

L1: Publication Data

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Home > Articles & Preprints > Published Articles > First observation of $\overline{B}^0 \to J/\psi K^+K^-$ and search for $\overline{B}^0 \to J/\psi\phi$ decays > Comments

Information | Discussion (0) | Files

First observation of $\overline{B}^0 \to J/\psi K^+K^-$ and search for $\overline{B}^0 \to J/\psi\phi$ decays - Aaij, R *et al* - arXiv:1308.5916

Main file(s):

prd.88.e072005

version 1 prd.88.e072005.pdf [1.32 MB] *07 Nov 2013, 15:17* *APS Open Access article*

Additional file(s):

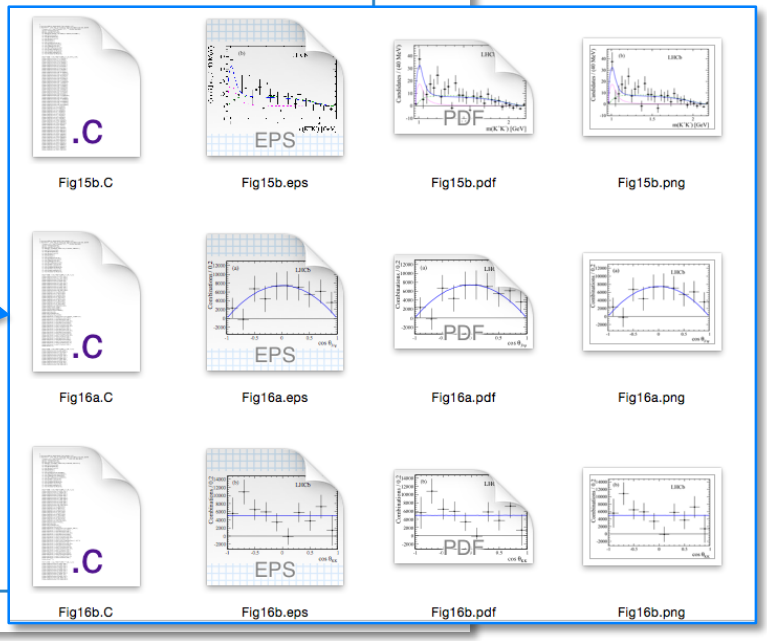
Related data file(s)

version 1 Related data file(s).zip [10.36 MB] *02 Sep 2013, 16:41*

arXiv file(s):

arXiv:1308.5916

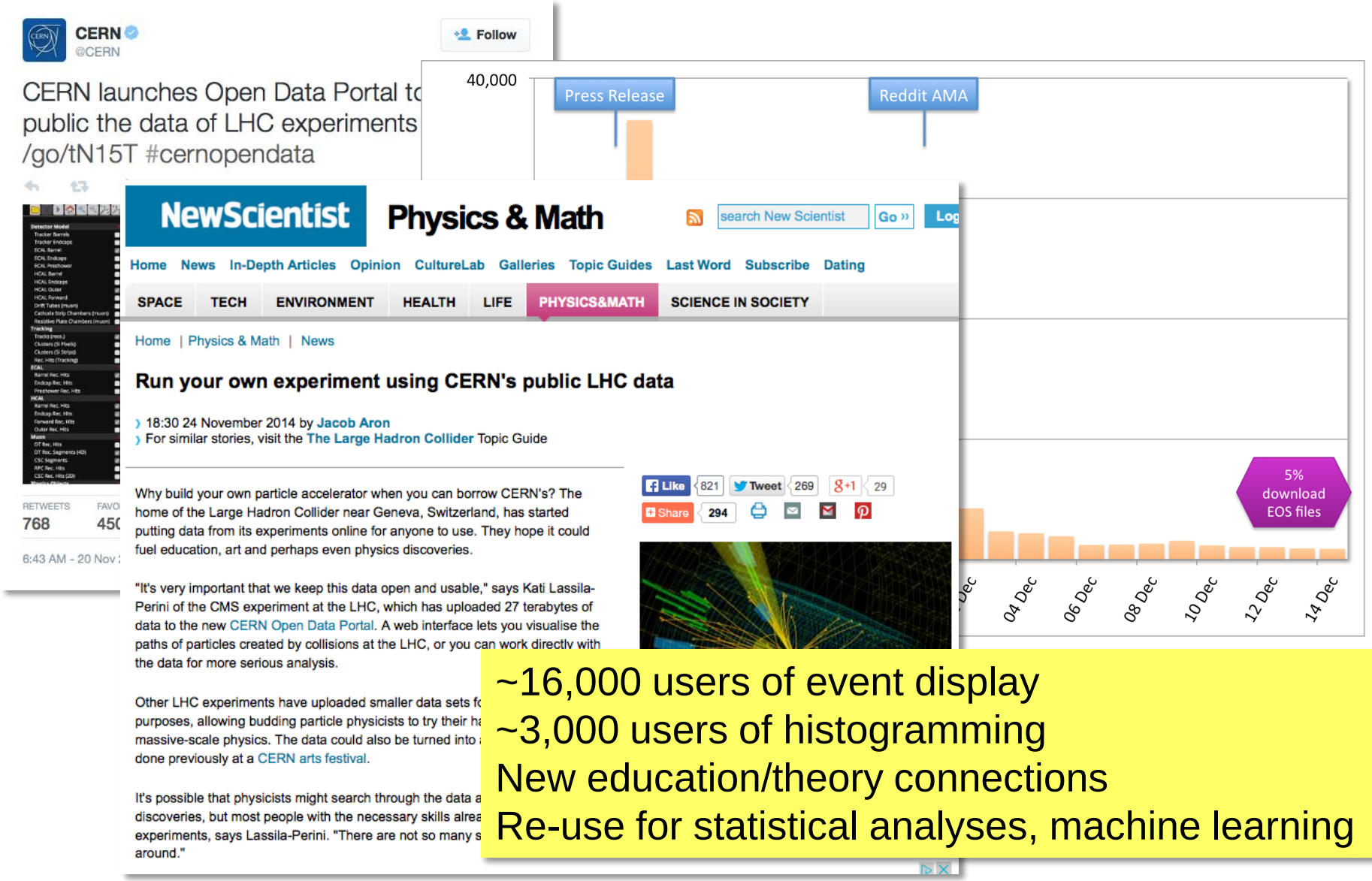
version 4 (see previous) arXiv:1308.5916.pdf [4.36 MB] *26 Oct 2013, 04:15*



INSPIRE HEP

Hep Data

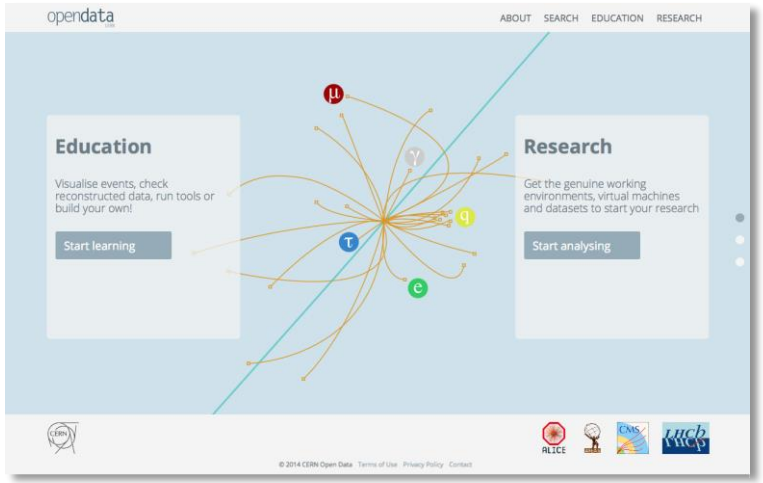
Interest

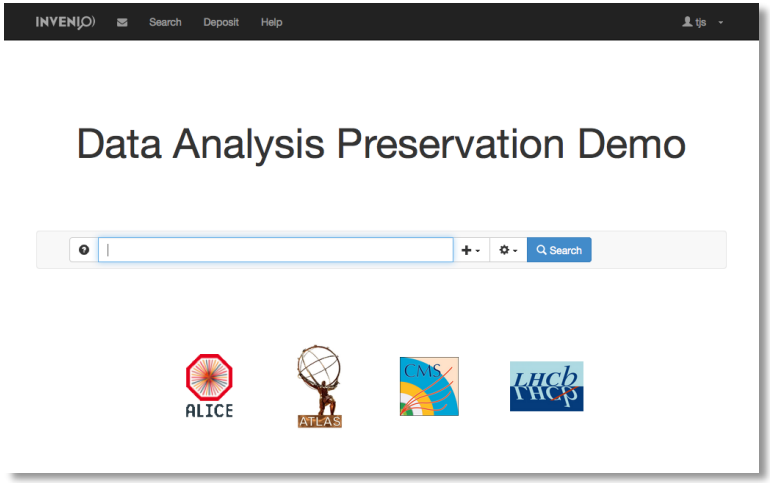


~16,000 users of event display
~3,000 users of histogramming
New education/theory connections
Re-use for statistical analyses, machine learning

Conclusion

Capture, Share, Preserve





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Mike Hildreth, Jakob Blomer, Luca Mascetti

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