Jupyter Notebooks with CMS Open Data

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CMS Data Preservation and Open Access
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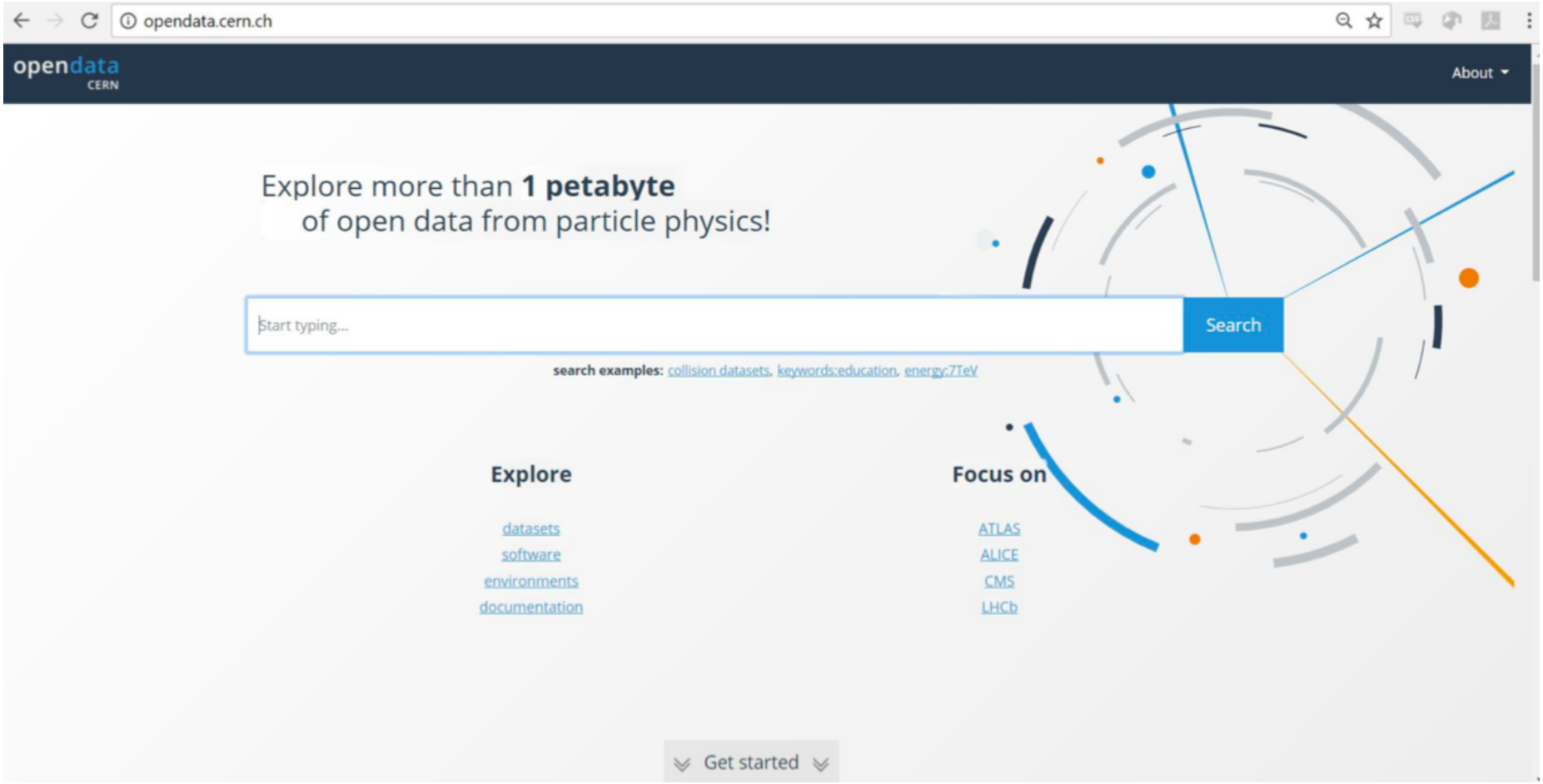
CERN Open Data Portal

All open data is available through CERN Open Data Portal!



What you should know from Open Data

Open data for Research

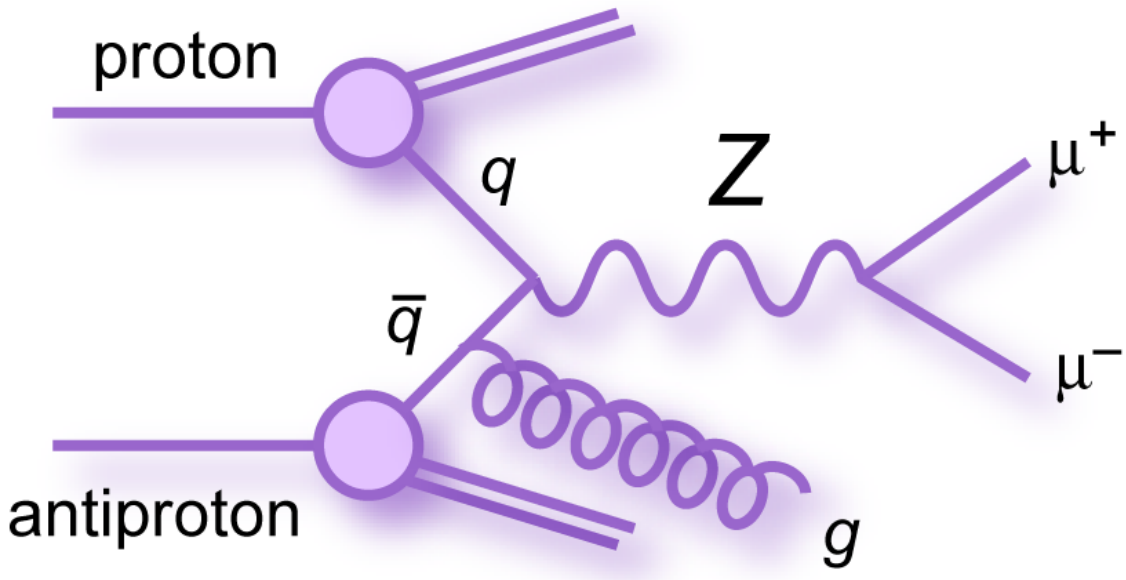
- We have released $\approx 1/2$ of Run1 data, we will release up to 100%
- Users download a VM image, and work in a lxplus type environment with acces to CMSSW and to the condition data through cvmfs
- Data can be accessed from eospublic through xrootd
- Several analysis examples and guides available (and more are coming)
- Open access fosters long-term availability and reusability of data

Education

- Event display is available on the open data portal, and first 25 events of each collision dataset are available in event display format
- Some samples of data have been prepared in csv format and can be used e.g. in jupyter notebooks (todays tutorial)

Click Here

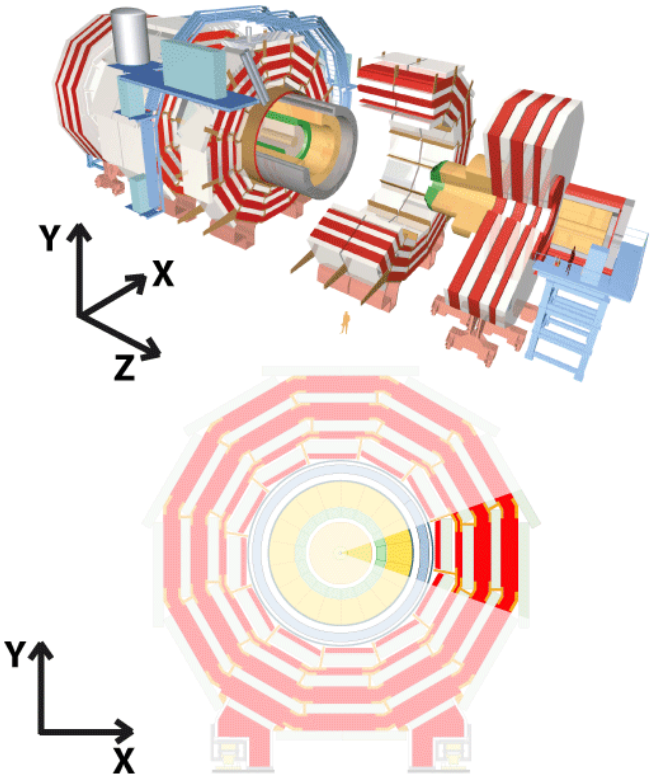
Invariant Mass in Dimuon Decay

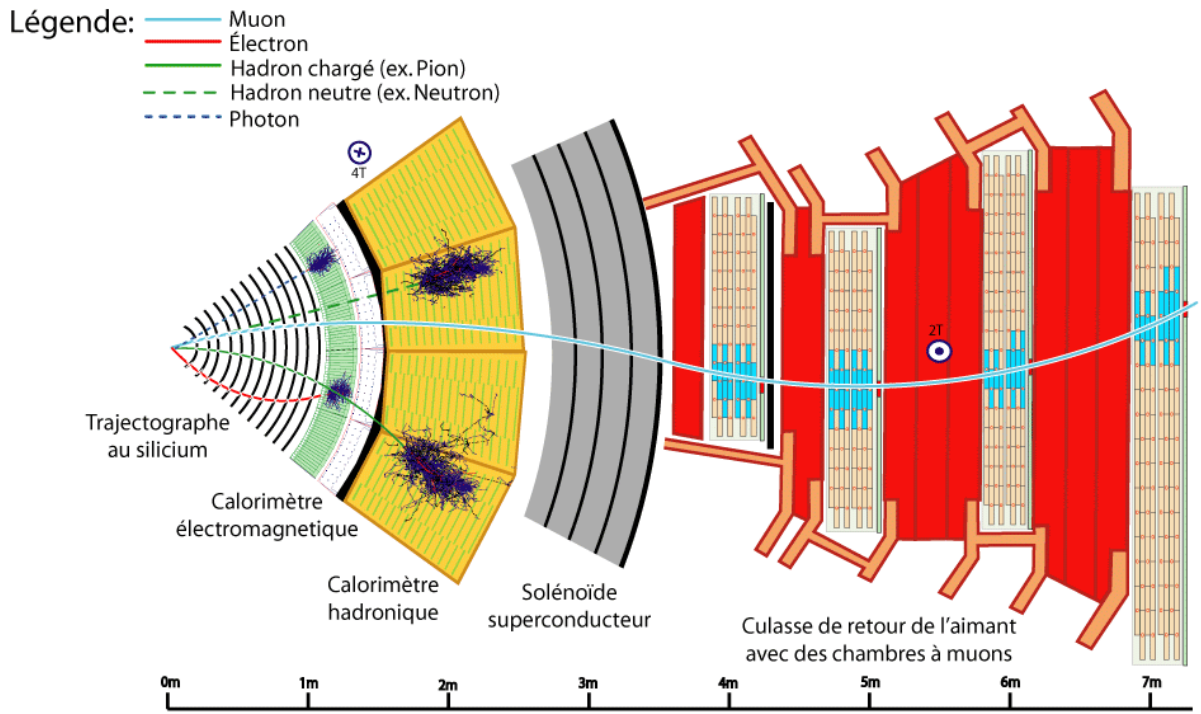


Theorem (Invariant Mass Calculation)

$$M^2 = (E_1 + E_2)^2 - || \boldsymbol{p_1} + \boldsymbol{p_2} ||^2 = 2p_{T1}p_{T2}(cosh(\eta_1 - \eta_2) - cos(\phi_1 - \phi_2))$$

CMS Transverse Slice





The End