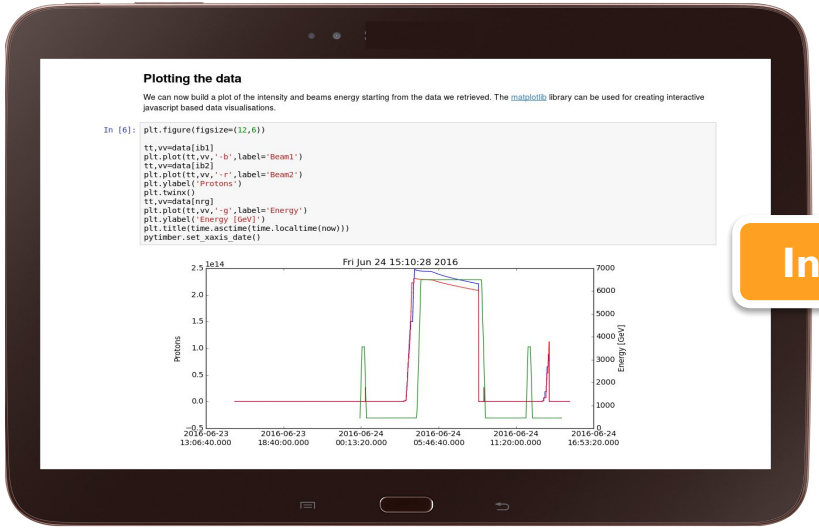
FCC Software meets

Javier Cervantes Villanueva
EP-SFT

Introduction to Notebooks

Jupyter Notebook: A web-based interactive computing interface and platform that combines code, equations, text and visualisations

http://jupyter.org/



In a Browser

Credit slide: Enric Tejedor, Danilo Piparo

Introduction to Notebooks

Text

Code

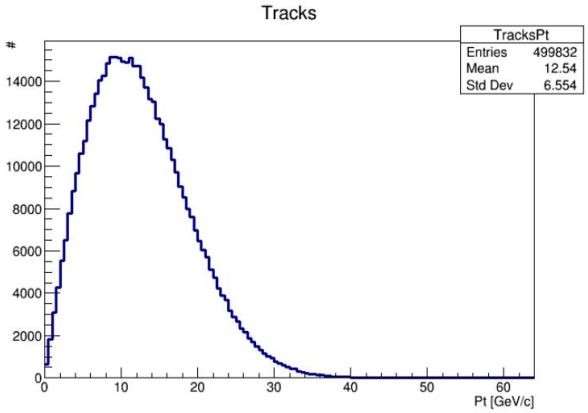
Graphics

Access TTree in Python using PyROOT and fill a histogram

Loop over the TTree called "events" in a file located on the web. The tree is accessed with the dot operator. Same holds for the access to the branches: no need to set them up - they are just accessed by name, again with the dot operator.

In [1]:
```
import ROOT

f = ROOT.TFile.Open("http://indico.cern.ch/event/395198/material/0/0.root");
h = ROOT.TH1F("TracksPt","Tracks;Pt [GeV/c];#",128,0,64)
for event in f.events:
    for track in event.tracks:
        h.Fill(track.Pt())
c = ROOT.TCanvas()
h.Draw()
c.Draw()
```



http://jupyter.org/

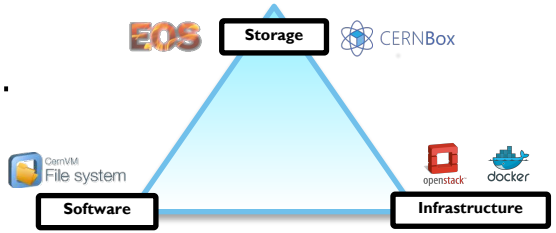
Credit slide: Enric Tejedor, Danilo Piparo

SWAN: Data analysis “as a service”

Interface: Jupyter Notebooks

Goals:

- Analysis only with a web browser
  - Platform independent ROOT-based data analysis
  - Calculations, input and results “in the Cloud”
- Easy sharing of scientific results: plots, data, code
  - Storage is crucial: mass & synchronised
- Simplify teaching of data processing and programming
- Integration with other analysis ecosystems: R, Python, …



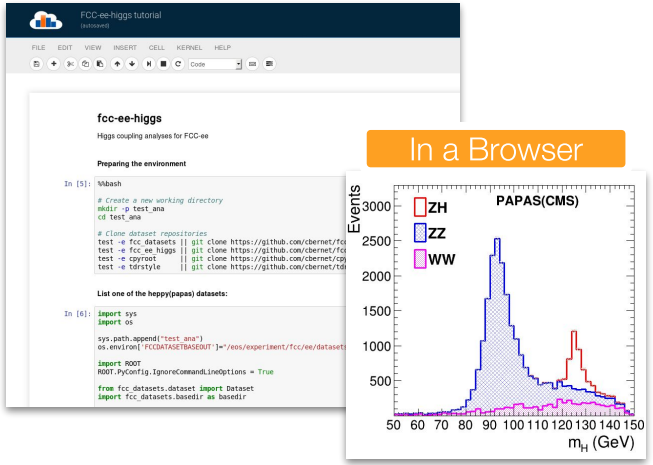
Credit slide: Enric Tejedor, Danilo Piparo

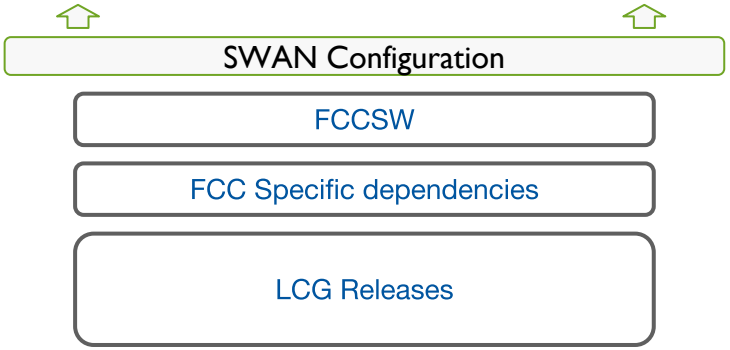
FCC Analysis in SWAN

Features:

- Analysis only with a web browser
- Easy sharing of scientific results: plots, data, code
- Simplify teaching of data processing and programming
- Integration with other analysis ecosystems: R, Python, …

FCC Software environment





Let's try it

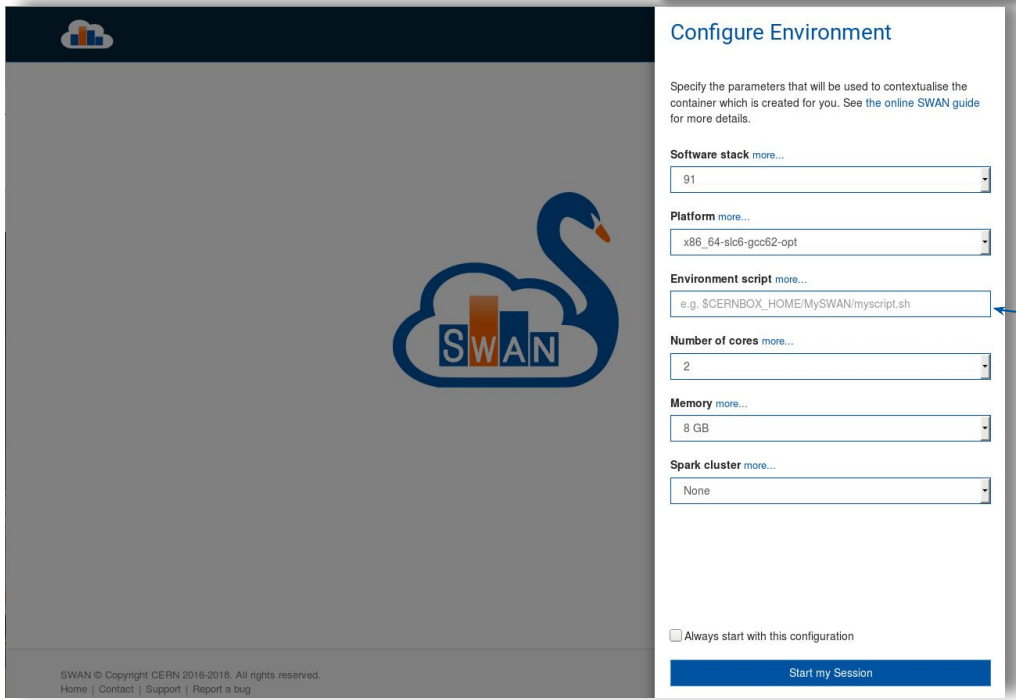
General use:

1. Go to swan.cern.ch
2. In Software stack, select the LCG Release
3. Start the session

FCC Specific environment:

1. Go to swan.cern.ch
2. Set Environment script
3. Start the session

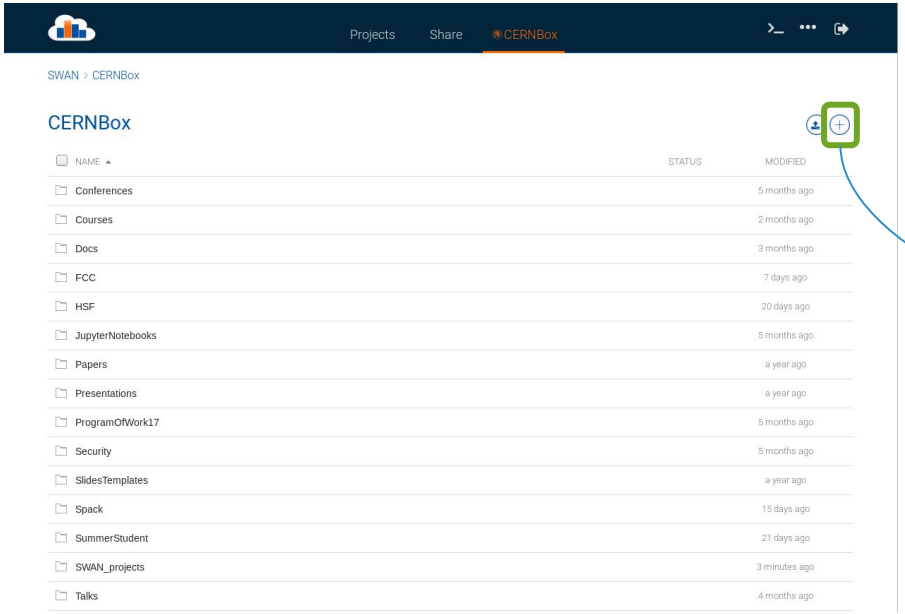
New interface (beta version)

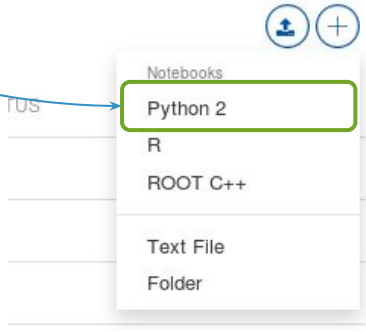



```
/cvmfs/fcc.cern.ch/testing/sw/views/stable-swan/x86_64-slc6-gcc62-opt/setup.sh
```

New Python Notebook

New interface (beta version)

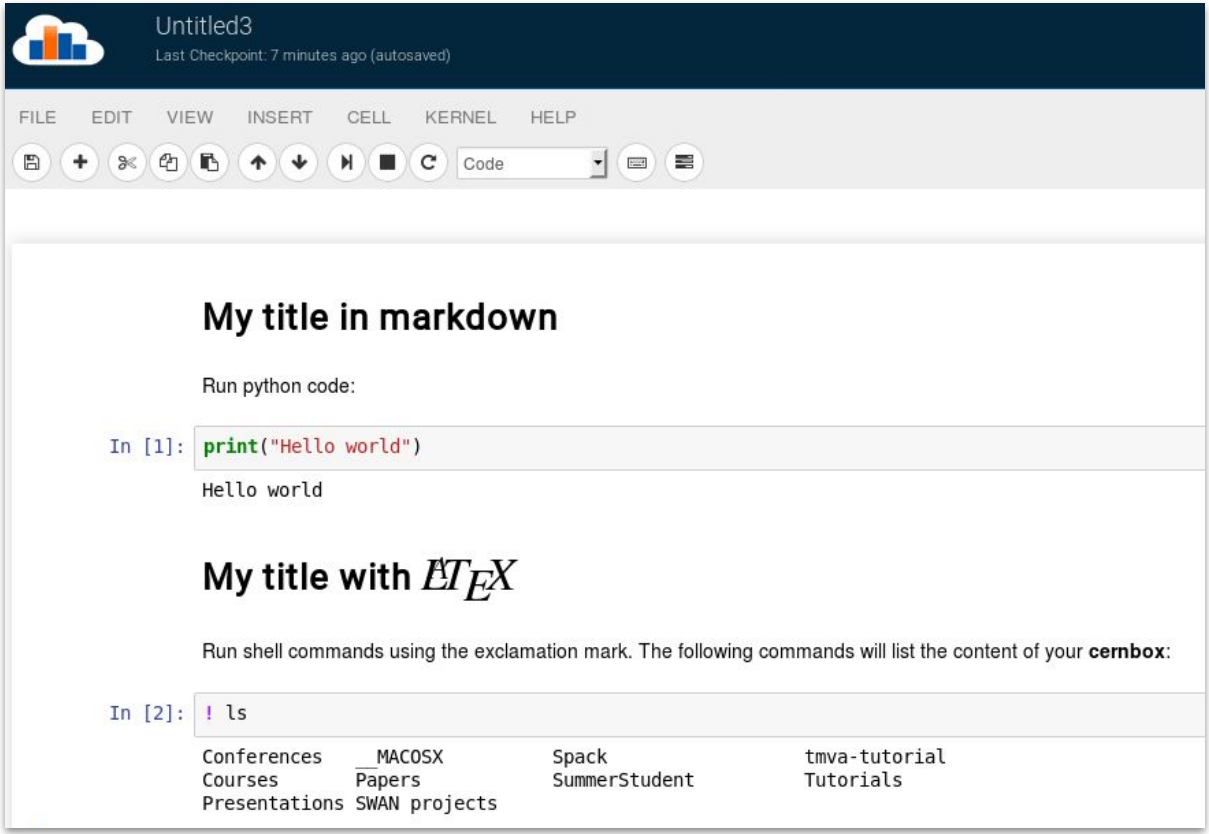




Different types of notebooks available

Access to your Cernbox user space

Start coding



New interface (beta version)

Demo

- *FCC Tutorial*
  - FCC: Getting started with the production and analysis of fast-simulated events

  - Tutorial in Swan - Download it from my Cernbox
    - Clone it to your space
    - Open a new Swan (using the FCC environment) session and open it

Incoming Swan versions:
- Easier sharing
- Easier experiment setups

Resources

- *SWAN Web: http://swan.web.cern.ch/*
- *SWAN Galleries: http://swan.web.cern.ch/content/basic-examples*
- *Jupyter notebooks and Swan episodes, included in the ROOT Cern Training Basic Course*