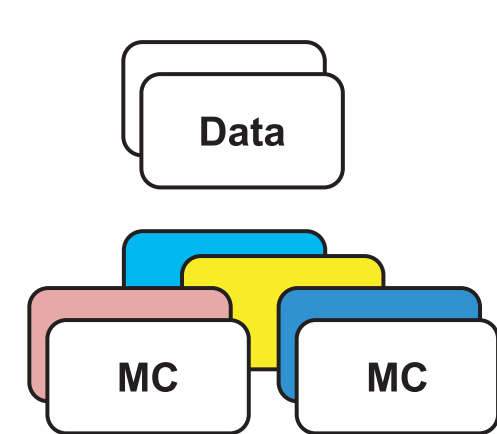


ATLAS Open Data: Data visualisation and educational physics analysis to re-discover the Higgs

ATLAS Open Data aims to introduce students to particle physics analysis without an initial exposure to the coding behind, with *tools for interactive data visualisation*. Web-based resources such as the “Histogram Analyser” are easy to use, yet informative. Students intrigued by the physics can then build up to coding an analysis by running Jupyter notebooks out of the box. Such notebooks invite them to read some short pieces of code, but without asking them to write any, just yet. With the use of these tools and documentation, **students can be guided to find the Higgs boson with only their mouse!**

Data release for education



+



HWWAnalysis

+

| | |
|---------------|--------------------------|
| e | μ |
| τ | γ |
| small-R jets | Large-R jets |
| Missing E_T | b \times boson tagging |
| Triggers | Truth |
| Weight & SF's | Systematics |

aimed at
university
students



DATASETS

10 fb⁻¹ data [1]
SM + Higgs MC

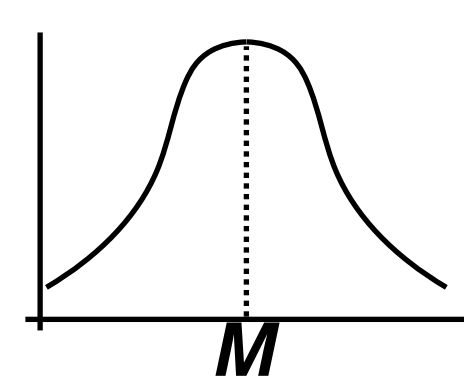
TOOLS

Jupyter notebooks
Mybinder access
Virtual Machines [2]

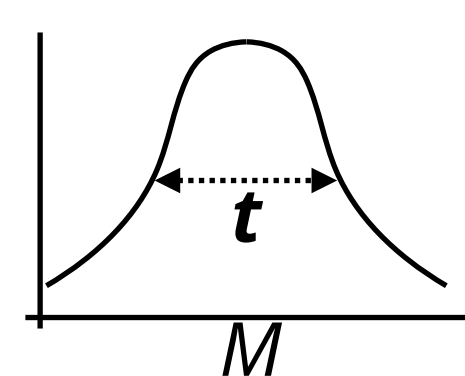
DOCS

Online documentation
Example analyses
YouTube videos
GitBook tutorials

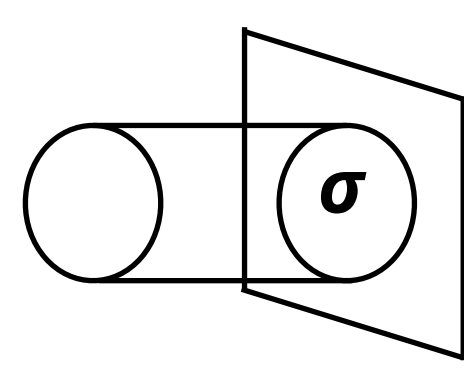
Student activities



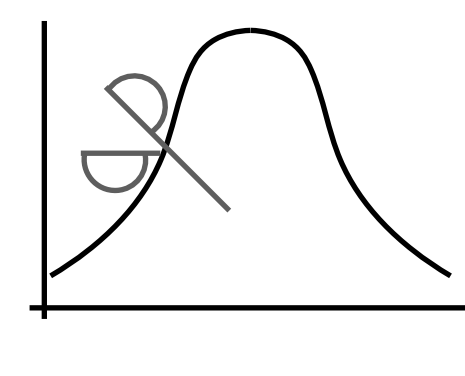
mass



lifetime

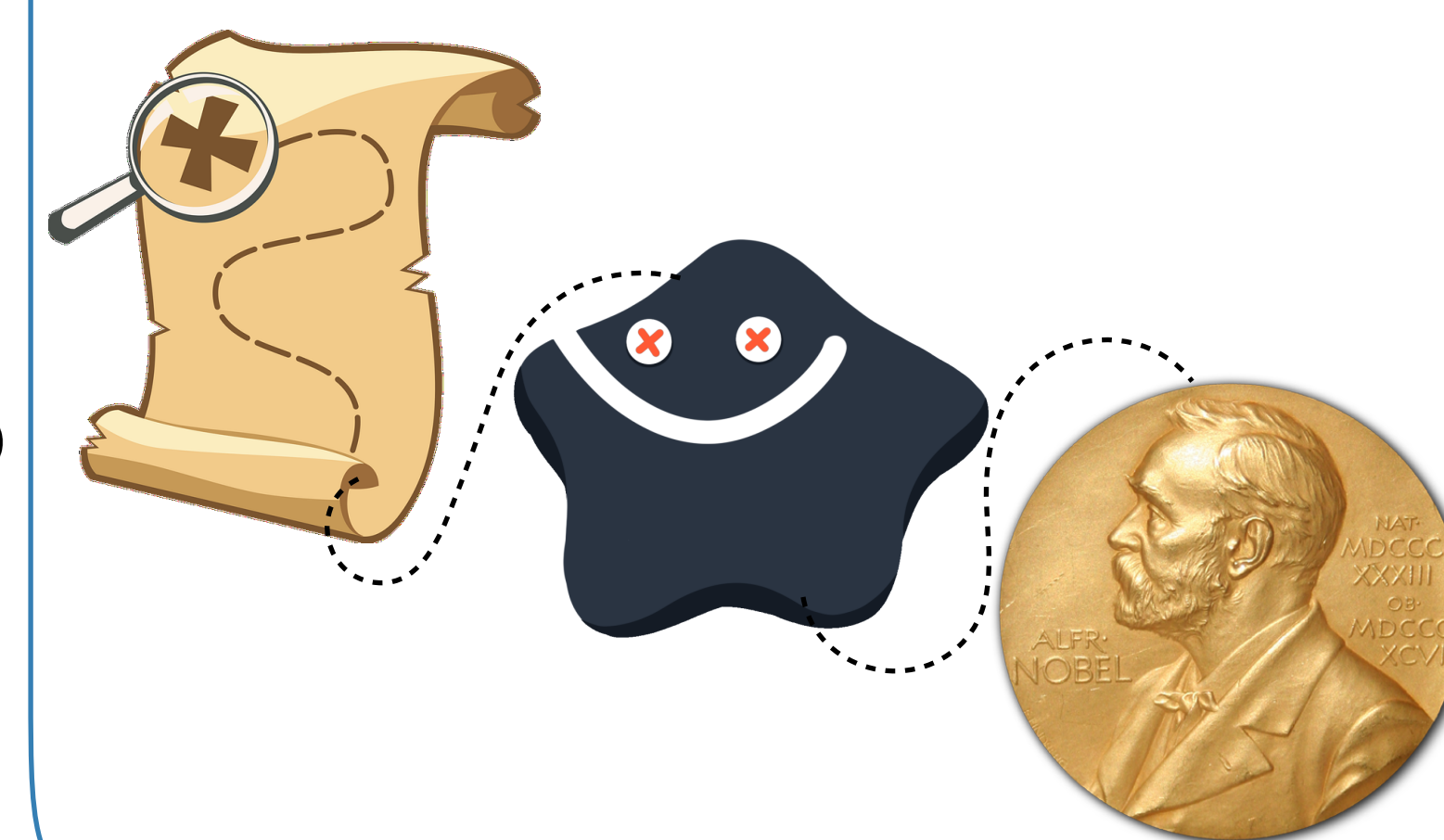


cross-section



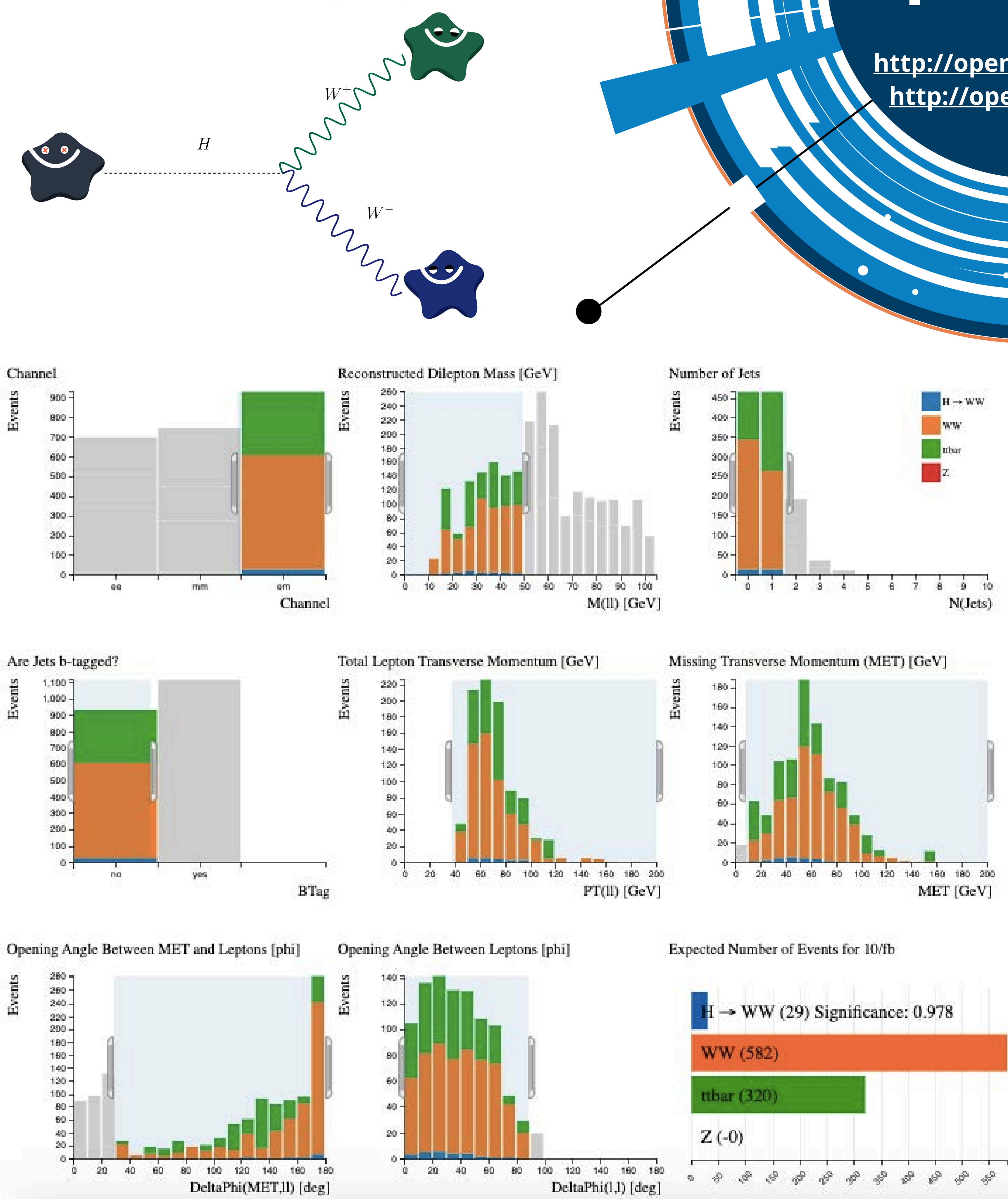
modify cuts

Hunt the Higgs



Histogram Analysers

Visualise changing cuts



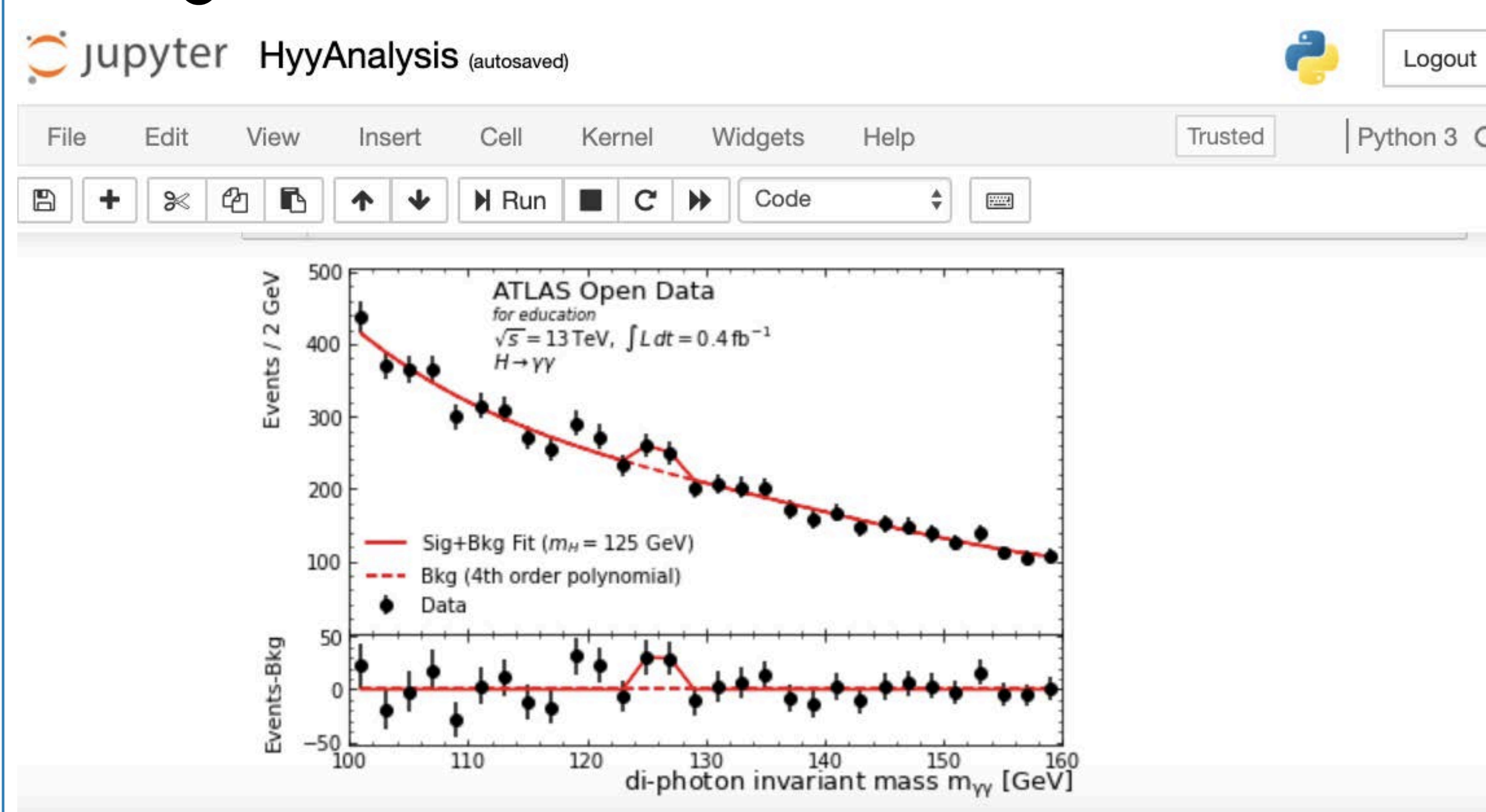
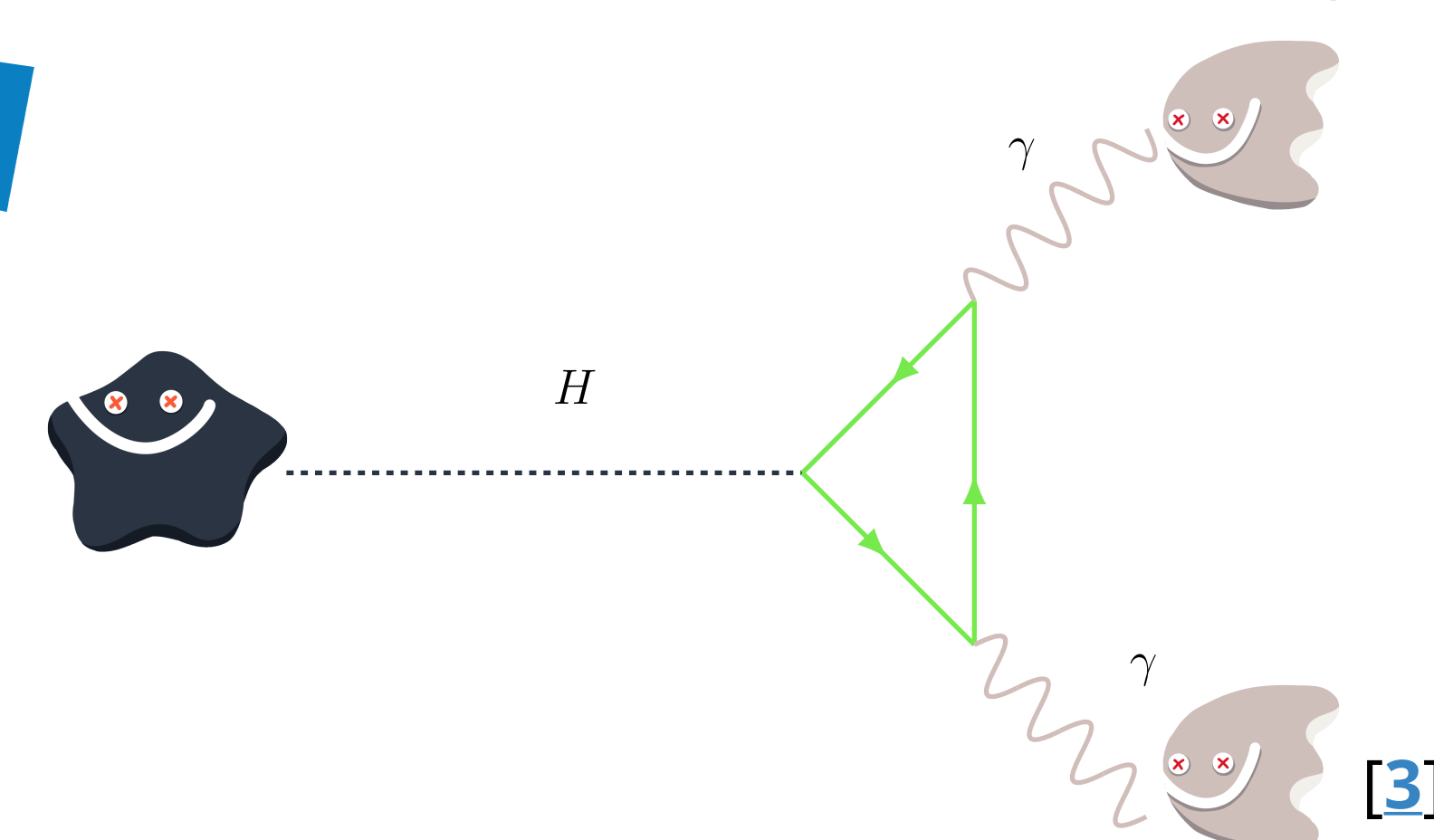
Try them yourself!

ATLAS Open Data

<http://opendata.atlas.cern>
<http://opendata.cern.ch>

Jupyter notebooks

Recreate the discovery



Topics

Histograms
Comparing samples
Invariant mass
Fitting

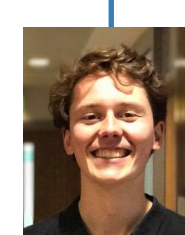
Languages

Python (without ROOT)
PyROOT
C++

Analyses

H \rightarrow $\gamma\gamma$
H \rightarrow ZZ

Try them yourself!



Presenter: Meirin Oan Evans