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

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

Visualise changing cuts

Recreate the discovery

Try them yourself!

Presenter: Meirin Oan Evans

Topics
Histograms
Comparing samples
Invariant mass
Fitting

Languages
Python (without ROOT)
PyROOT
C++

Analyses
H → yy
H → ZZ

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