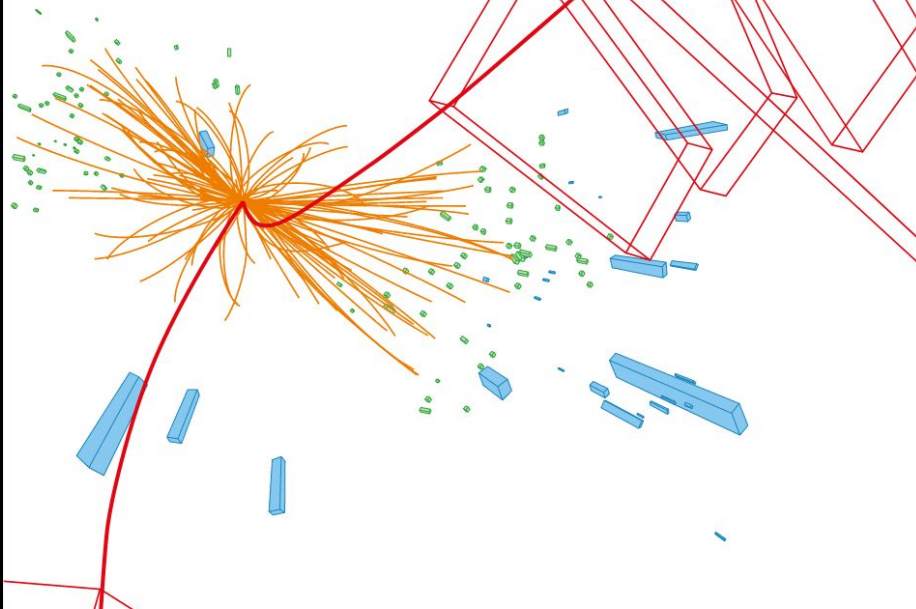


CERN COURIER

March/April 2019 cerncourier.com

Reporting on international high-energy physics

THE RISE OF OPEN SCIENCE



A new release of **Open Data** from the ATLAS experiment

Even S. Håland

University of Oslo

Spåtind (January 3rd, 2020)





What does the new ATLAS Open Data release contain?

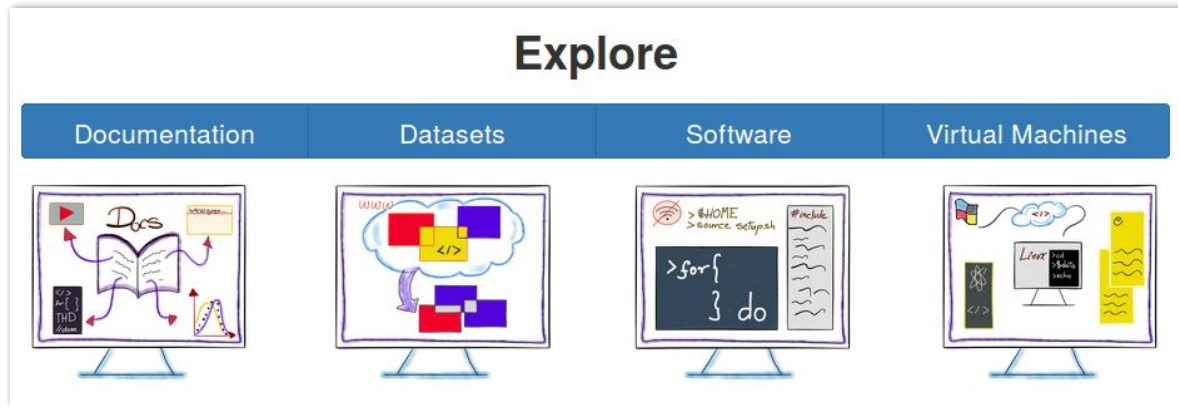


Which tools are provided to make data analysis accessible to students?



What kind of analyses can you do with this release?

The **ATLAS Open Data project** provides public access to ATLAS data and educational analysis tools.



2016: First release of ATLAS Open Data. (8 TeV)

2019: A new release of ATLAS Open Data has been prepared. (13 TeV)

<http://opendata.atlas.cern>

Target audience: university students.

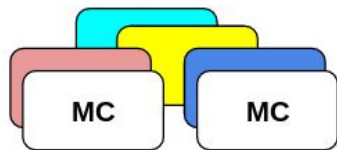
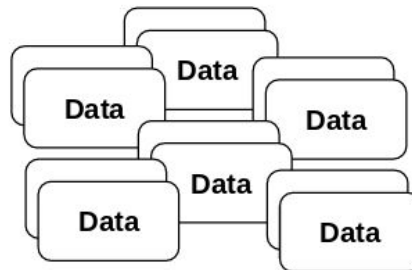
8 TeV release

13 TeV release

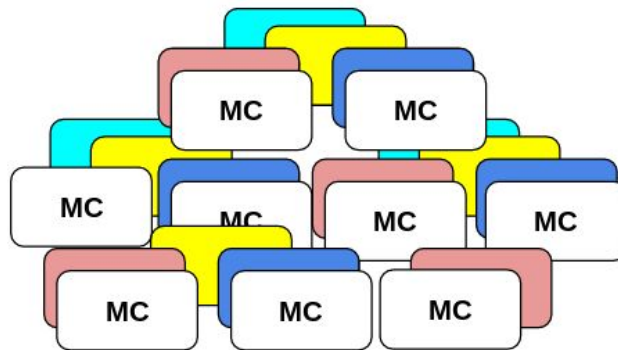
1 fb⁻¹



10 fb⁻¹



44 samples



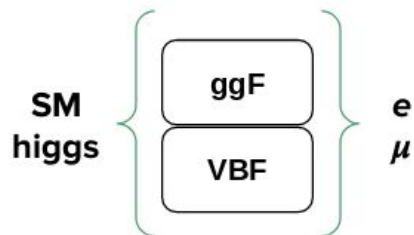
~120 samples

Total size: ~100 GB

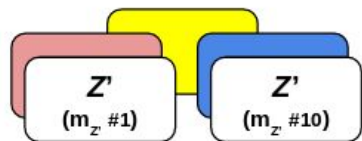
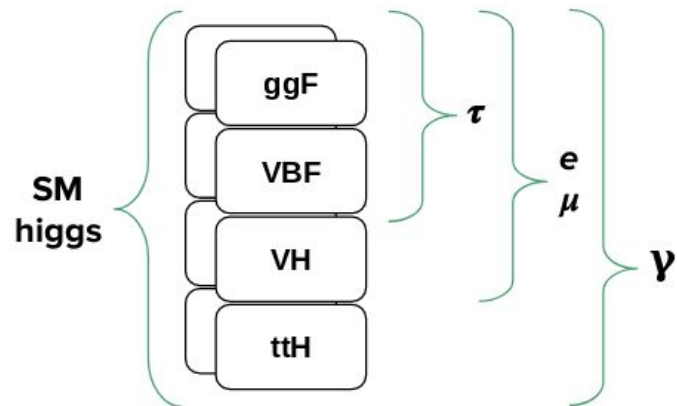
**Several collections,
filtered by final state.**

**Data format:
ROOT nTuples**

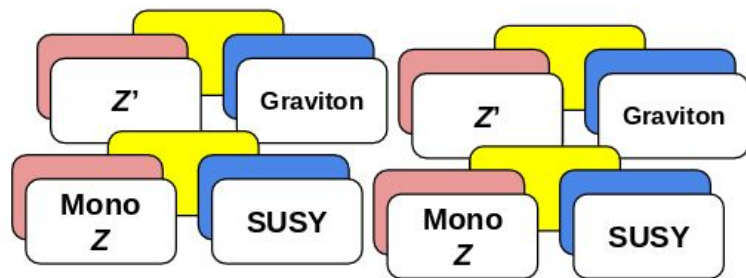
8 TeV MC signals



13 TeV MC signals

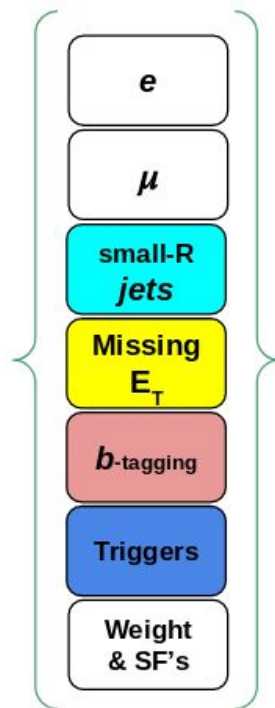


14 BSM samples



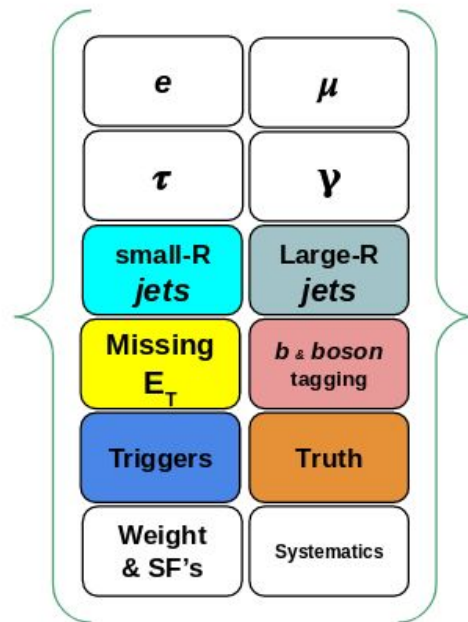
≥ 50 BSM samples

8 TeV TTree



~50 variables

13 TeV TTree



~100 variables

Software frameworks and other tools are developed to make data analysis accessible to students.

Software frameworks and other tools are developed to make data analysis accessible to students.

**C++/Python
code**

Software frameworks and other tools are developed to make data analysis accessible to students.

**C++/Python
code**

Notebooks

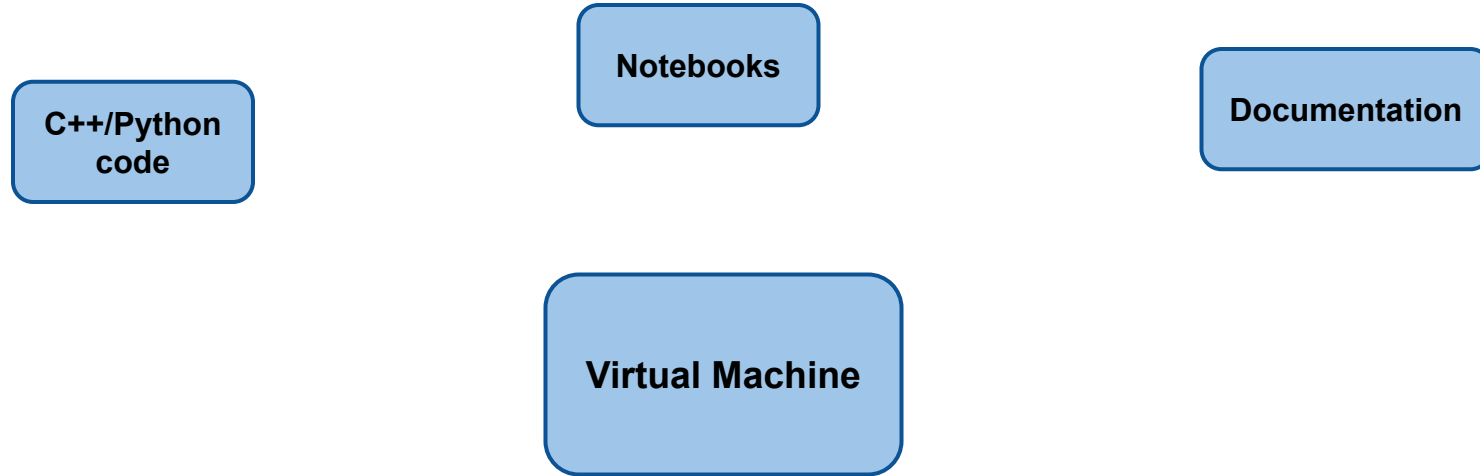
Software frameworks and other tools are developed to make data analysis accessible to students.

**C++/Python
code**

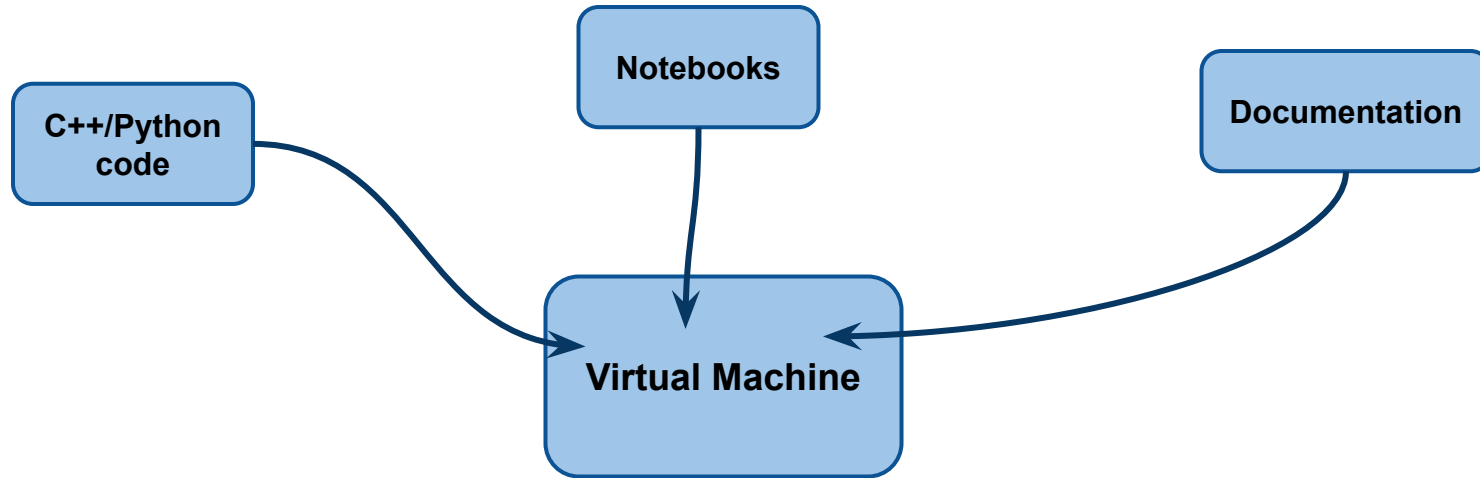
Notebooks

Documentation

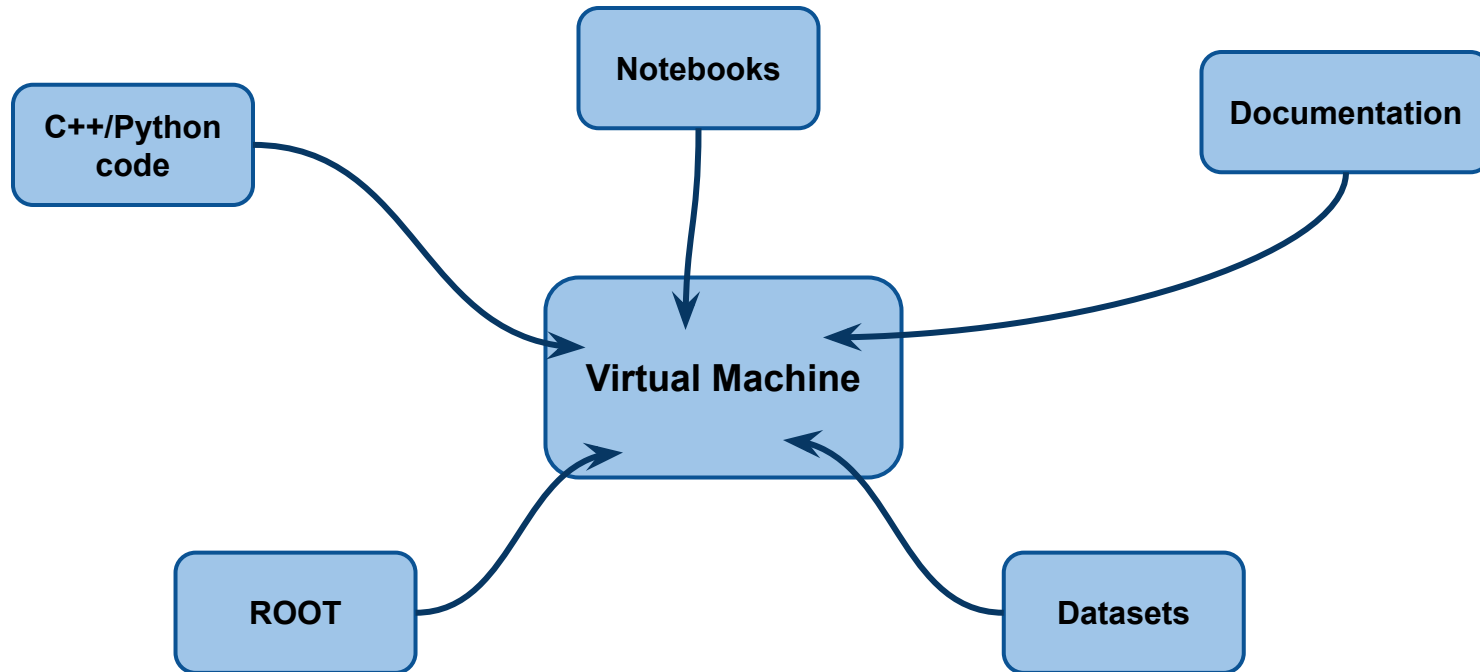
Software frameworks and other tools are developed to make data analysis accessible to students.



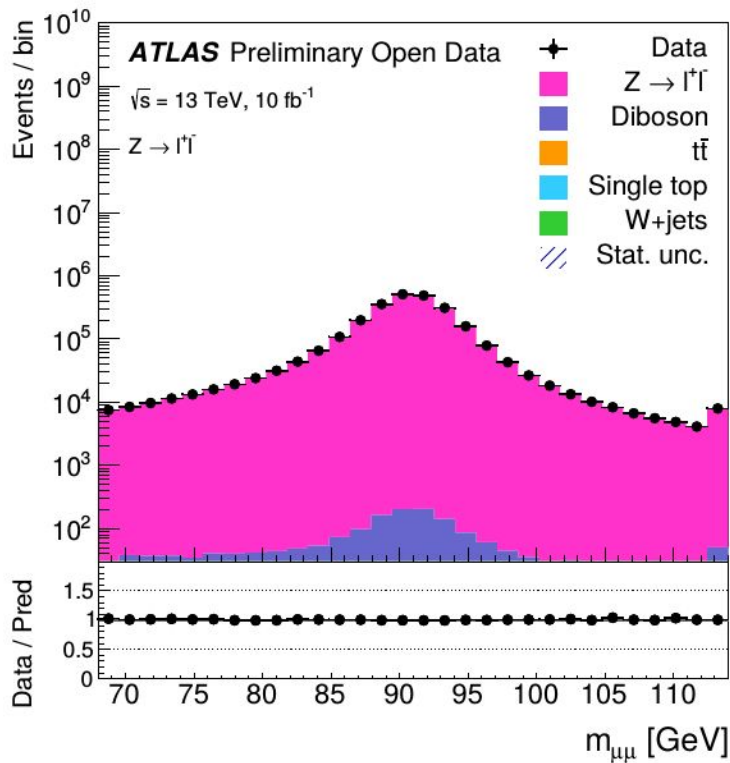
Software frameworks and other tools are developed to make data analysis accessible to students.



Software frameworks and other tools are developed to make data analysis accessible to students.



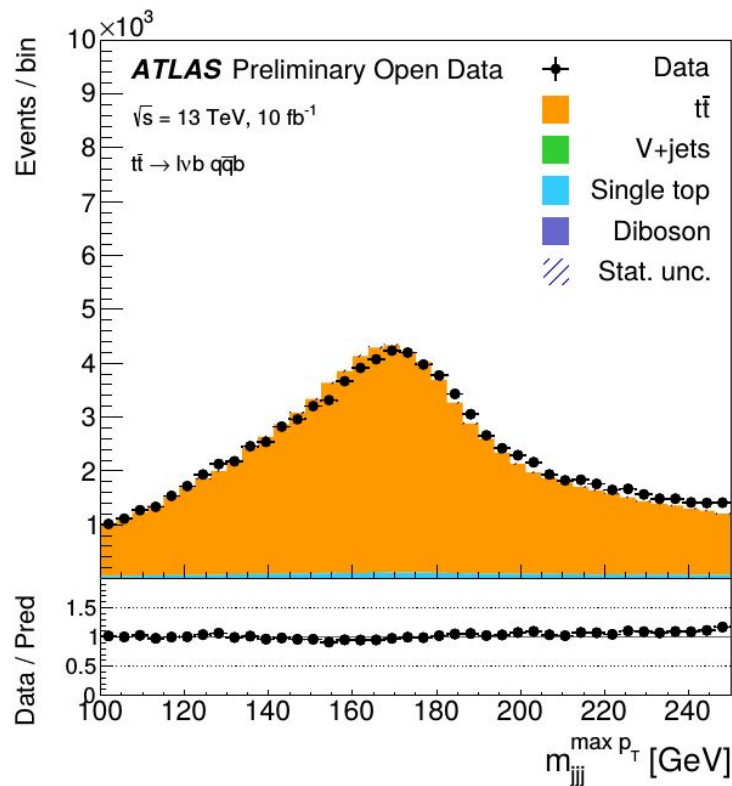
Standard Model processes are well modelled by the provided Monte Carlo samples.



Example 1:

$$Z \rightarrow ll$$

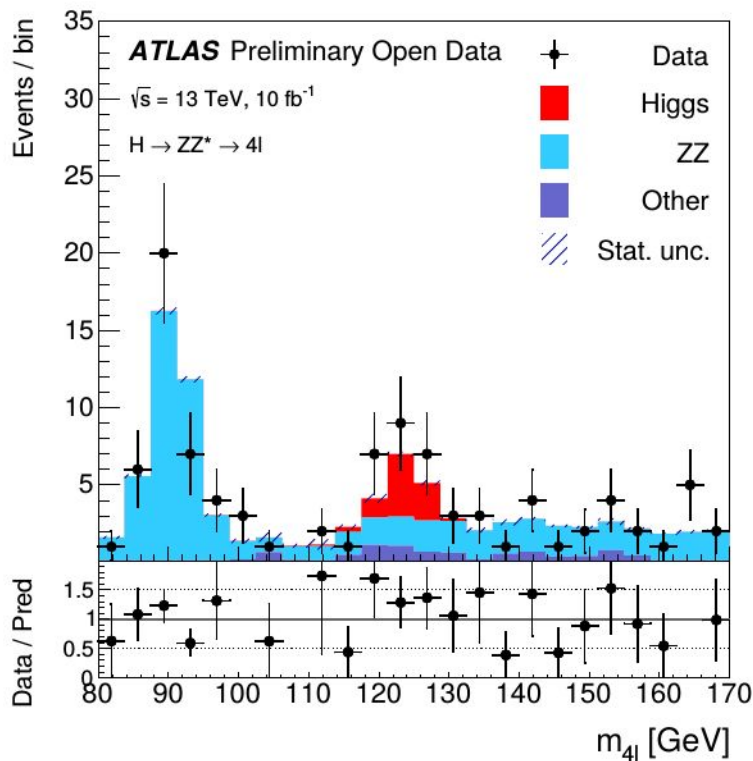
Standard Model processes are well modelled by the provided Monte Carlo samples.



Example 2:

$$t\bar{t} \rightarrow \ell \nu q \bar{q}' b \bar{b}$$

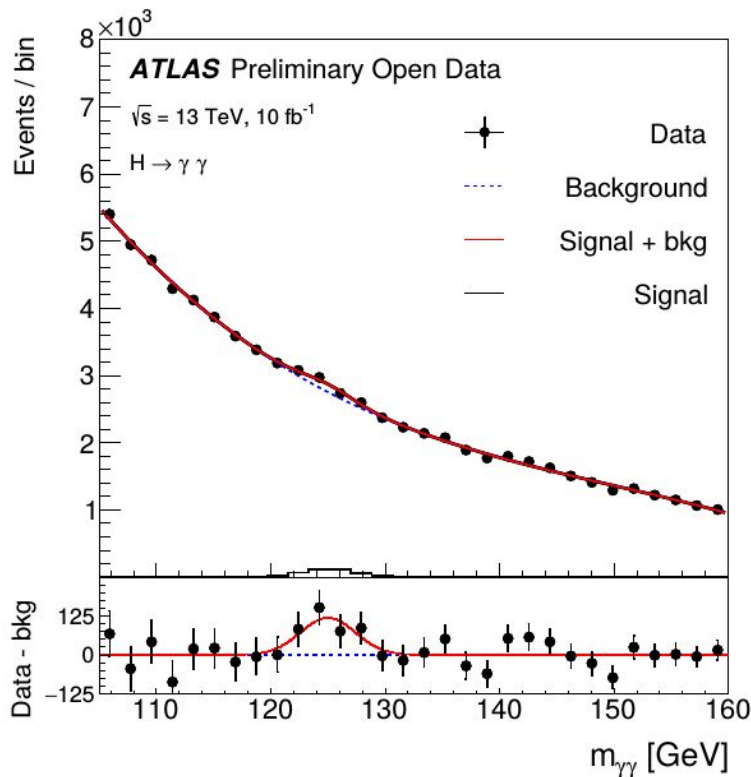
Searches for the **Higgs boson** can be done in several channels, and some mild excesses can be seen.



Example 3:

$$\text{Higgs} \rightarrow 4\ell$$

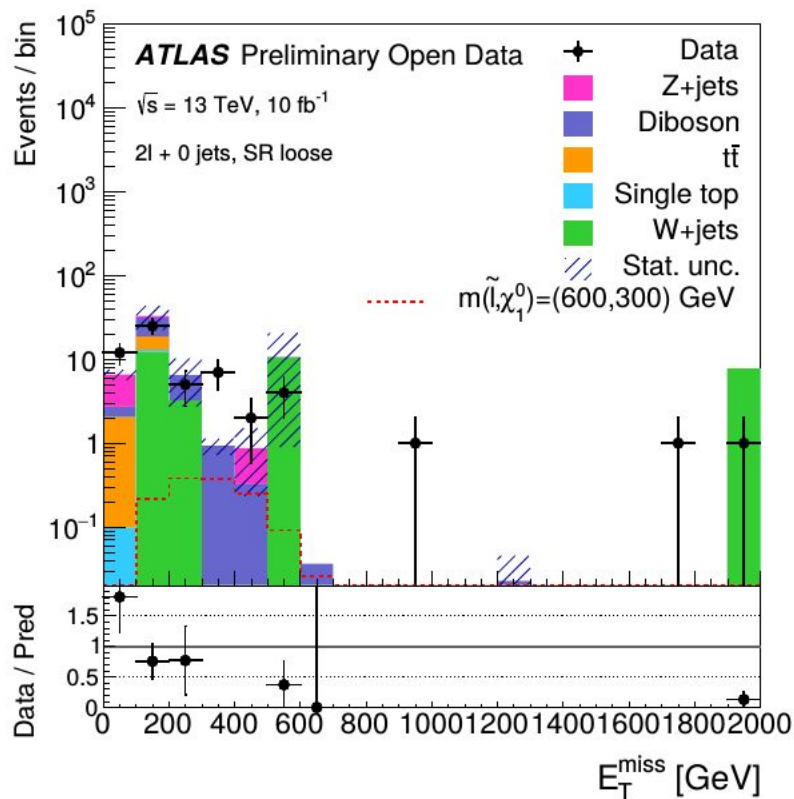
Searches for the **Higgs boson** can be done in several channels, and some mild excesses can be seen.



Example 4:

Higgs $\rightarrow \gamma\gamma$

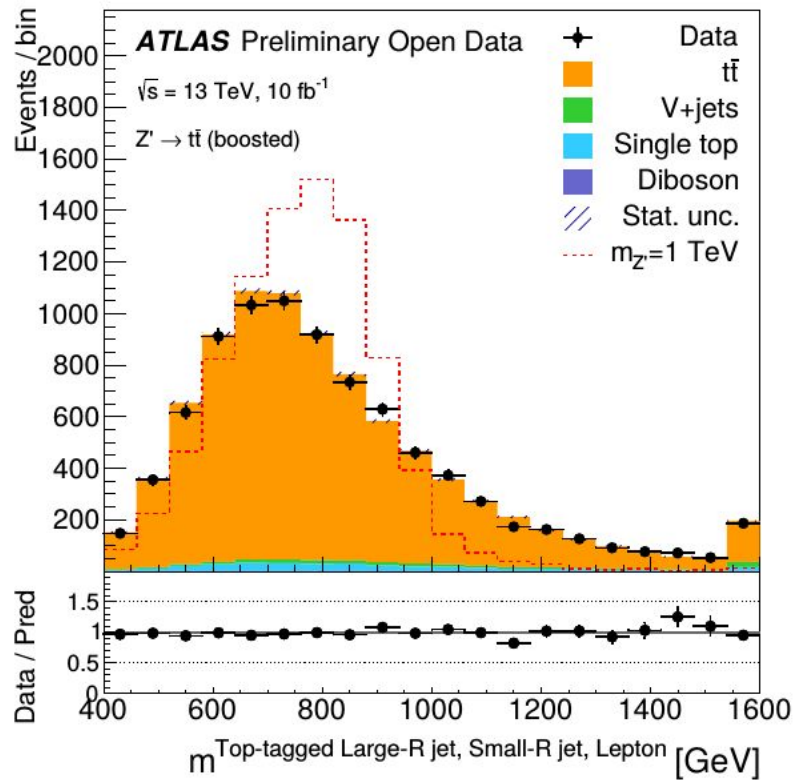
Signal samples are provided for a variety of **beyond Standard Model** processes.



Example 5:

$$\text{SUSY} : \tilde{\ell}\tilde{\ell} \rightarrow \ell\tilde{\chi}_1^0\ell\tilde{\chi}_1^0$$

Signal samples are provided for a variety of **beyond Standard Model** processes.



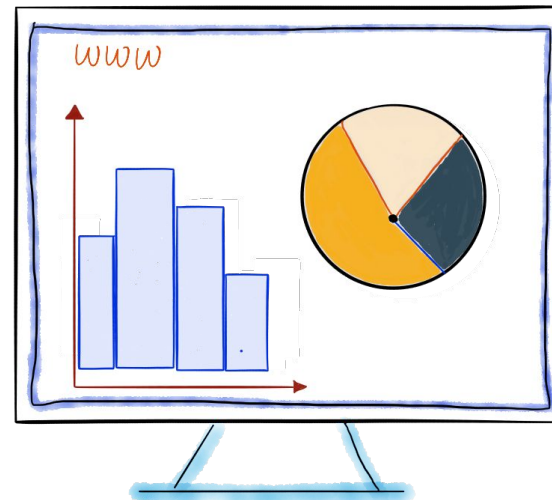
Example 6:

$$Z' \rightarrow t\bar{t}$$

Do you want to know more about
ATLAS Open Data?

CERN Open Data portal: <http://opendata.cern.ch>

ATLAS Open Data portal: <http://opendata.atlas.cern>



Stay tuned for the release!