ATLAS Open Data - Implementations and tools for the next release of datasets

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ATLAS
EXPERIMENT

Introduction to ATLAS Open Data

Open Data: Used by institutions (schools, universities) and individuals interested in experimental particle physics analysis techniques.

- Previous release: ATLAS Open Data collaboration (8 & 13 TeV) with tools like videos & data visualizers.
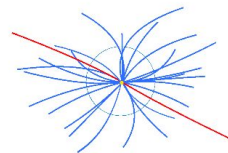
Current Effort:

- Consolidating 8 & 13 TeV tools and documentation in a single, organized, and accessible website.

New Campaign:

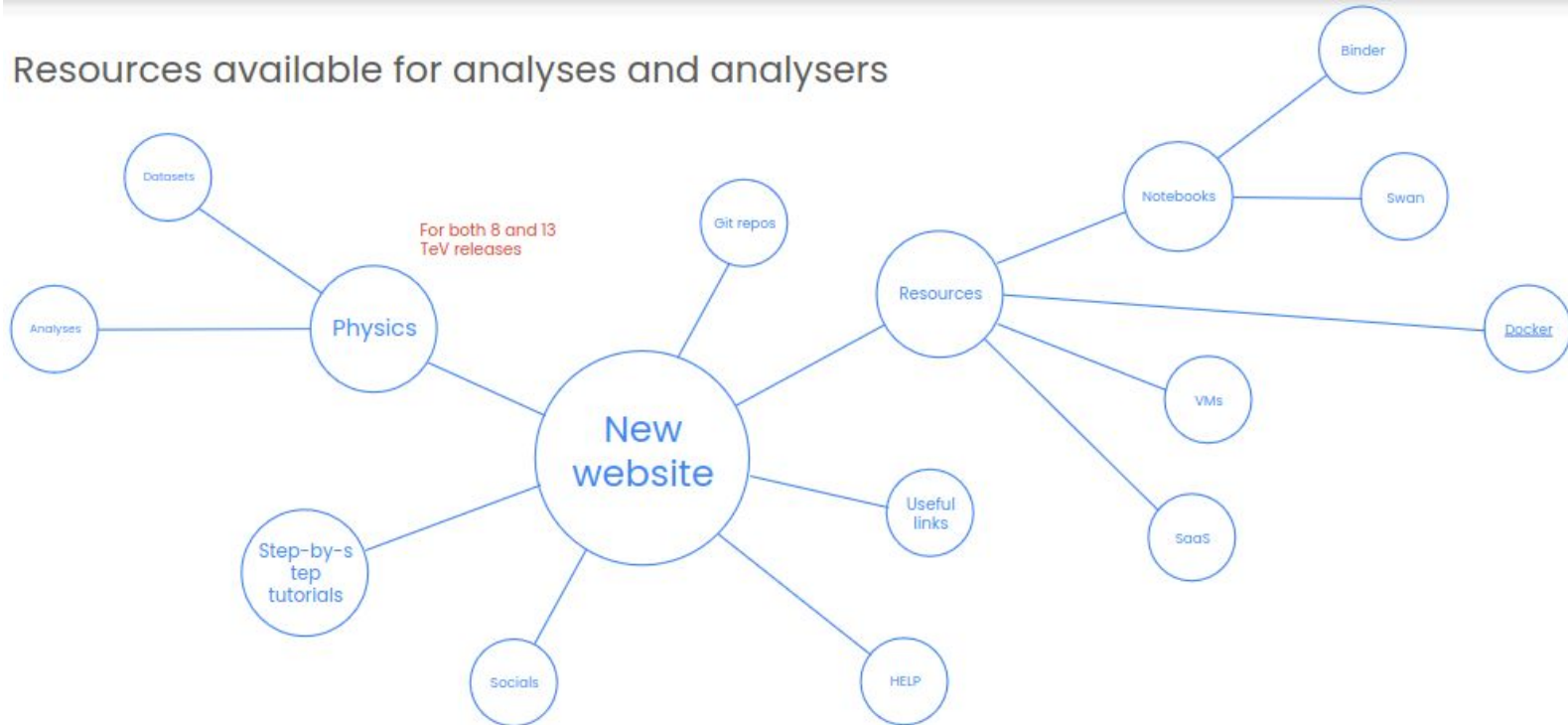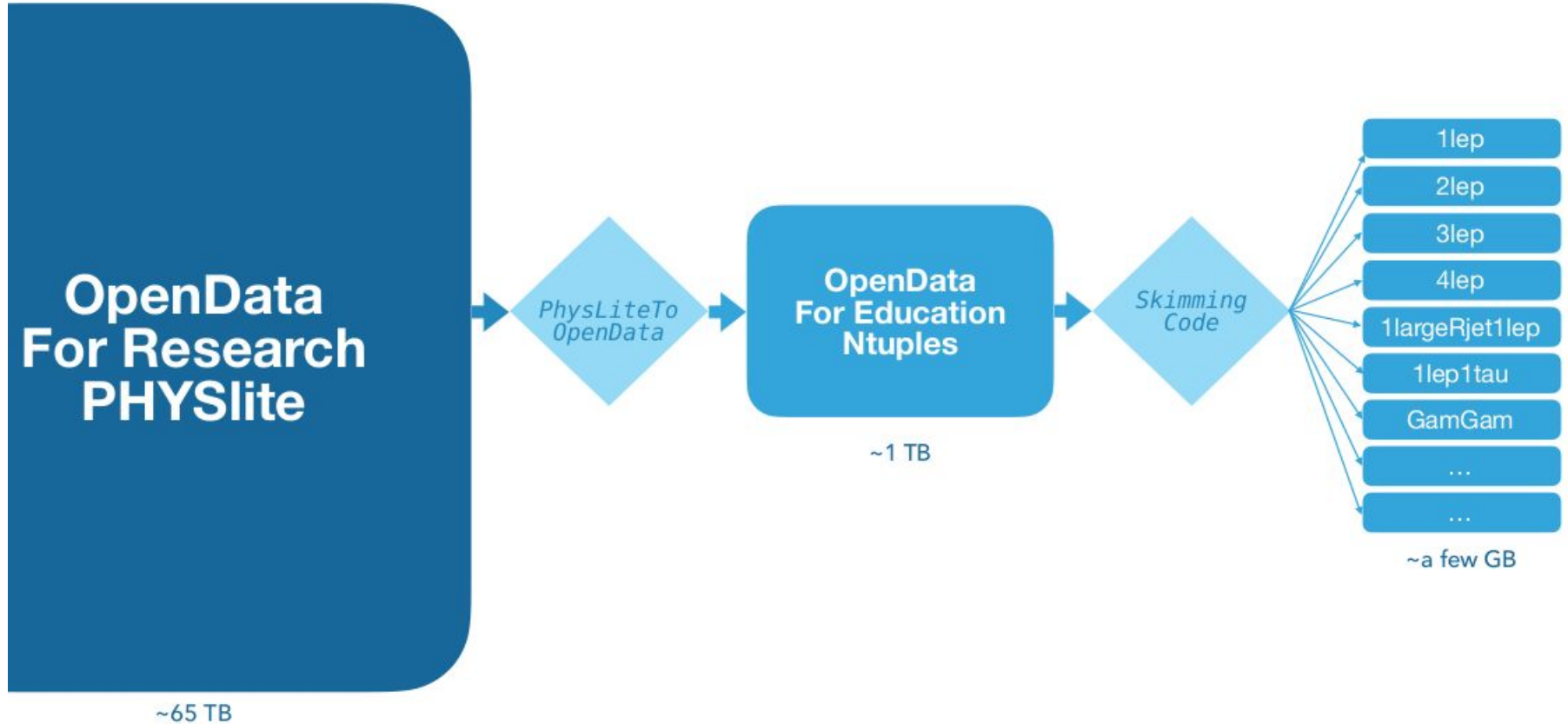- Preparing a 36 fb^-1 dataset release with improved documentation, new analyses, and expanded tools.

Website - Resources

- The 8 and 13 TeV documentation, analyses and tools have been collected to single website
  https://opendata.atlas.cern/

Resources available for analyses and analysers

New release of datasets to be released - workflow overview

Derivation Framework - PHYSLITE to Open Data

New Dataset Release: 2015/2016 data + MC samples for educational purposes.

- **Format**: Flat ROOT ntuples.
- Usable for existing & new/improved analyses.

Code Development: Available on GitLab.

- Input: DAOD_PHYSLITE → Output: Flat ntuple.
- Post-production: Metadata added to output ntuples.
- Open-sourced.

Validation:

- Run test analyses with "clean" processes & selections.

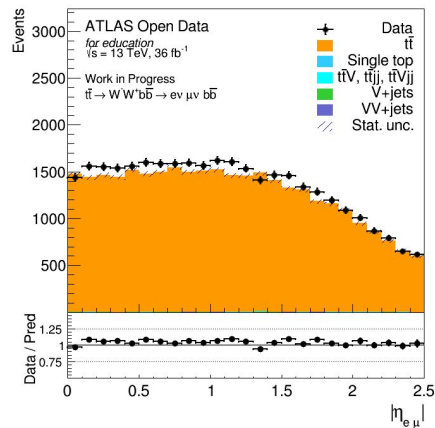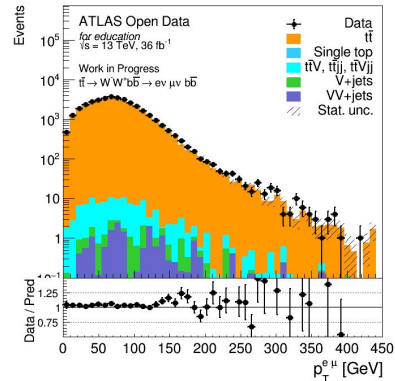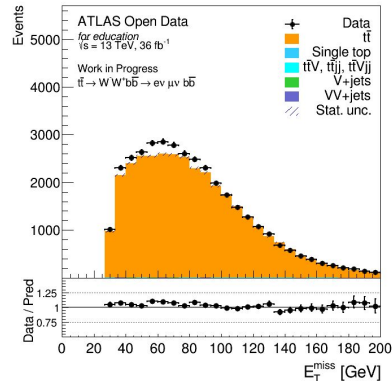# Validating Framework & Updating Analysis Examples

Validation process:

- Updating and running the analysis examples to validate the samples/code.
- Check we have all branches/objects needed.
- Check data/MC in various analyses to validate that SFs/etc are implemented.

Testing physics objects:

- Currently updated examples test electrons, muons, taus, jets (including b-tagging, Scale Factors and JVT) and MET.

Updating all framework versions:

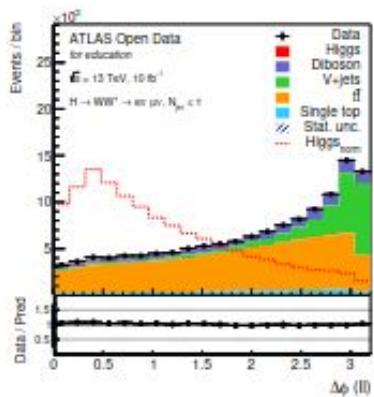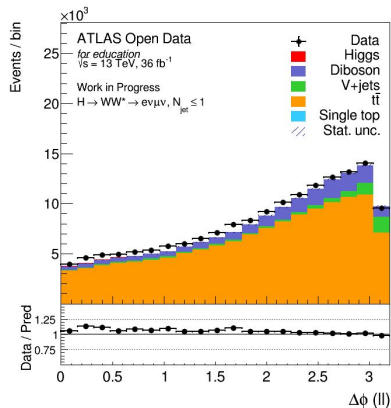- ROOT, PyROOT, Uproot, cpp

TTbarDilep Analysis:
- Clear final state.
- Perfect to test bjets, electrons and muons objects.

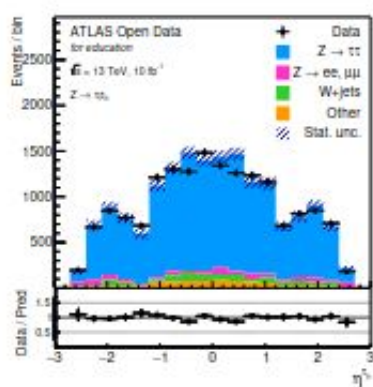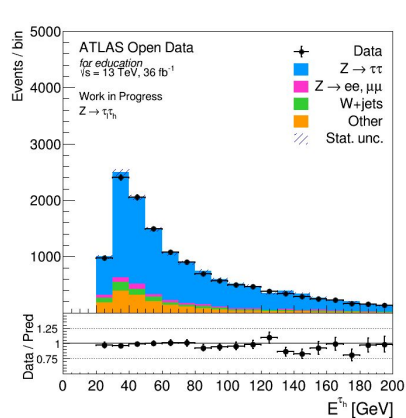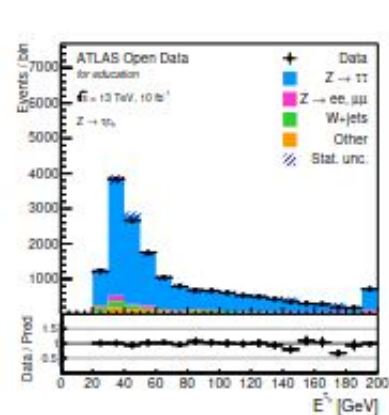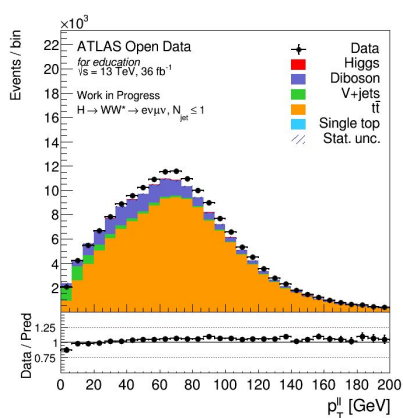# Validating Framework - Analysis Examples (HWW and ZTauTau)
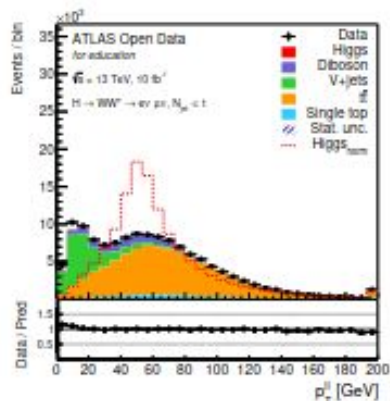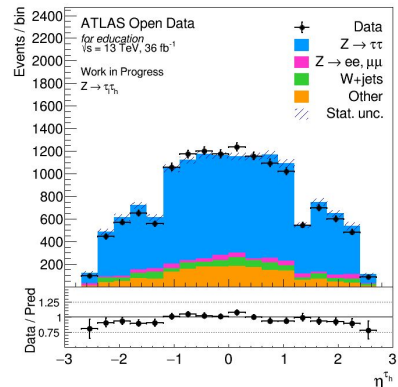
Release 2

Release 3

Release 2

Release 3

Data Collection and public release

Data Collection

- Previously, the release 2 had a number of "skimmed" data collections.
- Some quite lightweight and easy to download.
- Should consider what splittings are wanted and if any new ones should be produced

Current tasks to do for releasing the new datasets to the public

- Tutorials
- Instructions on how to run the derivation framework.
- Some analyses examples that validates the different ntuples.
- Updates the different repositories/notebooks and codes to use the third release.

Final-state categories	Leading object p_T (min) [GeV]	Collection name
$N_l = 1$	25	1lep
$N_l \leq 1$	25	2lep
$N_l = 3$	25	3lep
$N_l \leq 4$	25	4lep
$N_{\text{largeRjet}} \leq 1 \,\&\, N_l = 1$	250 (large-R jet), 25 (lepton)	1largeRjet1lep
$N_{\tau-\text{had}} = 1 \,\&\, N_l = 1$	20 (τ_h), 25 (lepton)	1lep1tau
$N_\gamma \leq 2$	35	GamGam

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Thanks!