Python Tools in High Energy Physics

LIP Internship Program
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This Tutorial
ROOT to python packages
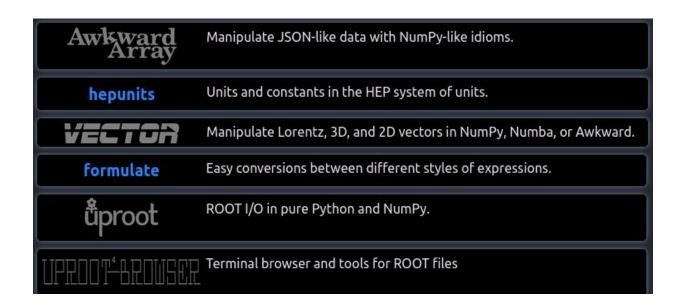

- Jupyter notebooks
- ML applications (scikit-learn, keras…)
- Pandas dataframes
- Matplotlib

This Tutorial
Scikit-HEP

- Community-driven project for Particle Physics data analysis in Python

- Provides a bridge between HEP and Python tools

Awkward Array	Manipulate JSON-like data with NumPy-like idioms.
hepunits	Units and constants in the HEP system of units.
VECTOR	Manipulate Lorentz, 3D, and 2D vectors in NumPy, Numba, or Awkward.
formulate	Easy conversions between different styles of expressions.
uproot	ROOT I/O in pure Python and NumPy.
UPROOT⁴-BROWSER	Terminal browser and tools for ROOT files

This Tutorial
Goal

- Repeat the ROOT basic tutorial using these packages - instructions also available in the notebook

  - Open and explore the root file

  - Read trees

  - Plot some variables

  - Fit a Gaussian function (extra if we have enough time)

- Notebook available here