
PyrootCK Documentation

Release

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Collection of utilities are organized into subpackages:

- `mathutils`:
 - `asymvar`: class for variable with asymmetric-error, inspired from `uncertainties.ufloat`.
 - `Eff`, `EffU`, `EffU_unguard`: functions to compute efficiencies with Clopper-Pearson uncertainty.
 - `weighted_average`, `weighted_harmonic_average`: when a simple average is not enough.
 - `combine_fully_correlated`, `combine_uncorrelated`, `combine_BLUE`: for combining multiple observables with uncertainty into one, given choices of correlation. For BLUE (Best Linear Unbiased Estimator), see Valassi, 2013.
- `iouils`
 - `import_tree` to quickly load `TTree` from (multiple) `TFile` overloaded for different source types (`local`, `ganga`, `eos`, `xrootd`, ...).
- `tmvautils`
 - `TMVA_Adapter` to help setup `TMVA`. Reader variables, and return `TTree` of mva-response weights.

As well as miscellaneous monkey-patching on `ROOT` and `uncertainties` for more methods:

- `ROOT`:
 - Misc conversion to/from `ROOT` (`TH`, `TGraph`, `RooWorkspace`, `RooFitResult`, ...) and `pandas` (`Series`, `DataFrame`).
 - `TFile.slice_tree` to extract `TTree` into smaller one.
 - `TTree.drop` to make index-unique `TTree`.
 - `TH1.vlookup`, `TH2.vlookup`: like in Microsoft Excel, to retrieve value in a bin given point(s) on the axis.
 - `TMultiGraph.brazillian`: for the upper limits plot.
- `uncertainties`:
 - class `var`, based on `ufloat` but ready-made for statistical (Poisson) error.
 - Additional methods on `ufloat`: `rerr`, `upperlim`, `low`, `high`, `interval`, `rounding_PDG`
 - More methods involving error tag: `tags`, `get_error`, `get_rerr`

See the docstring from module index for more details.

CHAPTER 1

Installation

It's available on pip: `pip install pyrootck`

Dependency: `uncertainties, pandas, root_numpy, pyroot_zen, PythonCK`

CHAPTER 2

Disclaimer

This package was written and used during my PhD in 2013-2017 at EPFL (Lausanne) and LHCb collaboration (CERN), for the work in $Z \rightarrow \tau \tau$ cross-section measurement and $H \rightarrow \mu \tau$ searches at LHCb (8TeV).

I hope it can be of a good use for future analysis...

CHAPTER 3

Indices and tables

- `genindex`
- `modindex`
- `search`