Science & Technology Facilities Council
Rutherford Appleton Laboratory

RooUnfold developments

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Unfolding Framework
Project Meeting
9th February 2011

RooUnfold version 1.0.3 improvements (14 Jan)

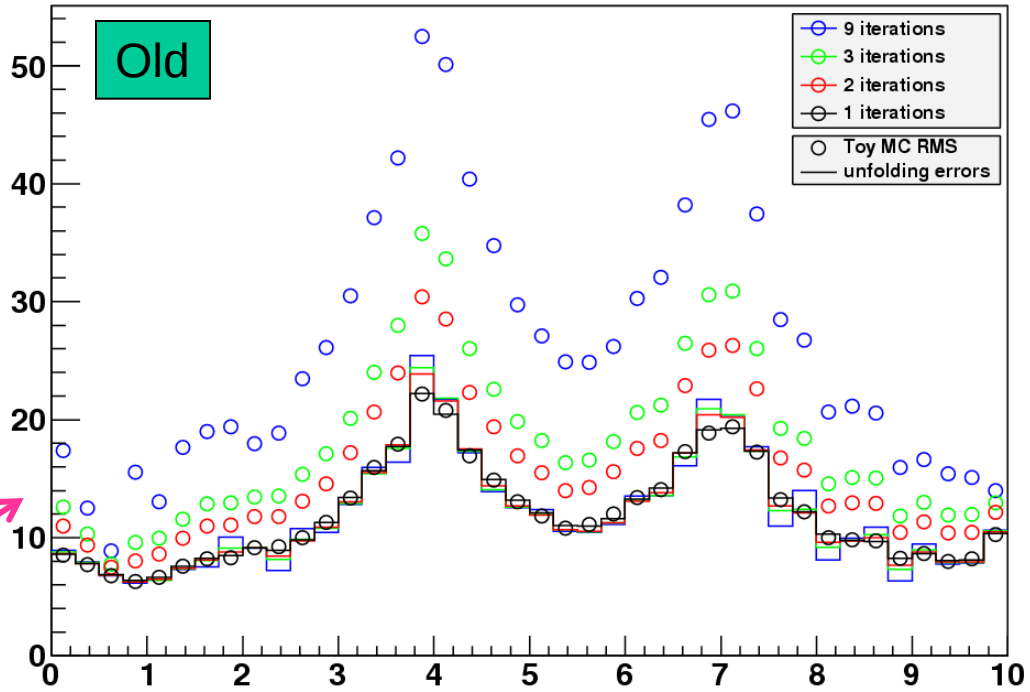
- Improved SVD algorithm now in ROOT 5.28 (TSVDUnfold)
  - Use this from ROOT if available, else use copy in RooUnfold package
- Work around ROOT problems on MacOSX
- Can use TH1F or TH1D histograms interchangeably
- Improved class methods' documentation
- New interface to D'Agostini's `bayes.for` for comparison with our RooUnfoldBayes

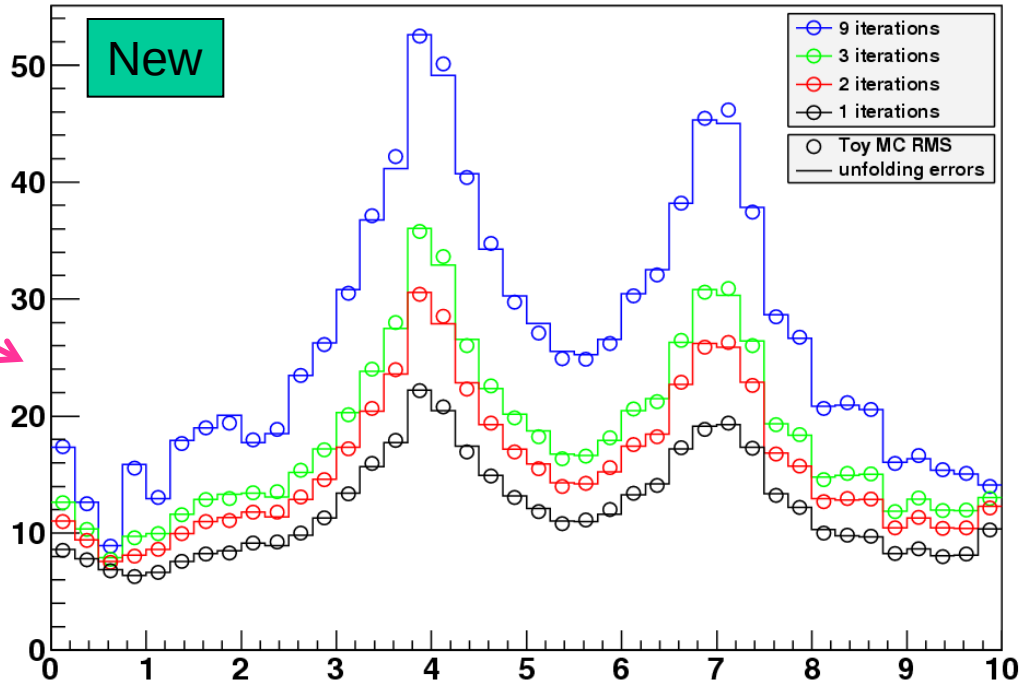
Recent developments (in SVN)

- New libRooUnfold.rootmap for automatic loading and PyROOT support
  - RooUnfoldExample.py
- Rewrote RooUnfoldBayes
  - Rationalised and considerably optimised
    - Now uses ROOT matrix and vector classes
  - New error calculation
    - a bit slower

Bayes Errors

- Errors from Bayes unfolding were wrong
  - D'Agostini's paper did not account for dependence on previous iterations in error propagation
  - Did not agree with toy MC
- Now fixed in RooUnfoldBayes
  - Error propagated through each iteration
    - See attached note for details
  - Agrees with toy MC
- Can be trivially extended to handle correlated measurement bins





New Ideas

- Use new error calculation in latest TSVDUnfold (in SVN)
  - no longer needs slow toy MC
    - See Kerstin Tackmann's PHYSTAT talk
- Better handling of response matrix errors
- Support for correlated measurement bins in error calculation
- Interface to iterative dynamically stabilized method
  - See Bogdan Malaescu's PHYSTAT talk

- Discussed unfolding packages with Lorenzo Moneta from the ROOT team
  - Would like to add RooUnfold to next ROOT version
  - Move TUnfold and TSVDUnfold into a common library/namespace with RooUnfold
    - Could still be used independently, or via RooUnfold