

# Analysis Tools Feedbacks from AWGs Breco TDBC Charmonium Charm

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# Breco

- Common practice
  - Most analyses: BRecoUser to produce big ntuples
    - pre-CM2 practice
  - A few others: reskim to add persisted candidates and/or UsrData
    - Use BetaMiniApp -like user package or Kanga macros to produce small ntuples.
  - PID: Most still use killing (old releases). Not many use re-weighting or tweaking.
    - Systematic: some fixed values (conservative?) that may or may not be well justified for their analysis.
    - One analysis I know (mine) compared PID efficiency between data control sample and re-weighted signal MC in bins of momentum to estimate systematics.



# Breco (cont.)

- Request and wish list
  - General machinery for Cherenkov angle parametrization and fit.
  - Common Neural Network tools.
  - Ways to deal with moving  $m_{ES}$  end-point
    - Will SP8 reproduce data?
    - How to fit/correct for this effect?
  - Put all efficiency correction tables in CDB ( $K_S$ , neutrals, soft pions?).
  - New types of objects in UsrData (`BbrDoubleErr` , `TMatrix` , etc.).
  - More power to Kanga : add/remove/modify candidates, UsrData, etc.
    - Is anyone supporting Kanga ??



# Charm

- Many different approaches
  - Some have used CM2 approach (reskim, UsrData) to produce small ntuples.
  - Some still produce large ntuples (but still can do analysis very effectively).
    - Eg. Antimo: Own C++ code to combine tracks, do vertexing, etc, to produce large ntuples including many modes. Split data into small files according modes. Recycle Fortran code in the past to do analyses.
- Has a full suite of flexible event tags
  - Very useful because skim usually can't foresee new analyses.



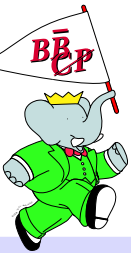
# Charm (cont.)

- PID: use reweighting, avoid using killing.
- A fitting tool (developed by Michael Wilson, also based on Minuit) is used in  $D^0$  mixing analyses. It's better suited and more robust for these high statistics analyses. (than RooFit). Could be made public at some point.
- Some easy-to-use plotting package on top of root would be nice.



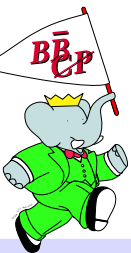
# Charmonium

- Many issues prompted by  $Y(4260)$  in ISR production.
  - The need of EvtGen model of ISR that includes higher order photon production.
  - The need of a reliable generic ISR background production.
  - More selections in SimpleComposition suitable for ISR analysis. See Jochen's talk for IHPS.
  - A forum to discuss improvement in SimpleComposition .



# TDBC

- A typical analysis:  $B^0 \rightarrow c\bar{c}K_S$ 
  - Start with a tight skim (BTocck\_Final or BFlav\_Final ) close to final selection.
  - Re-reconstruct candidates.
  - Flavor tagging from usual tagging sequences.
  - Write ASCII files using BtsWriteASCII in UpsilonTools for analysis.
  - Final analysis/fits done with RooFit , (models like RooBCPGenFit.cc or RooBCPTFit.cc in RooFitBabar ), using a large set of macros for various tasks.
  - For some of the systematics, such as DCSD, there are separate macros, which would probably be useful for anybody doing CP analysis.



# Summary

- Many approaches to analysis.
- Many make good use of CM2.
- Many others use “old-fashion” style analysis. Can still be effective.
- Some tools would be nice to have. Some AWGs seem quite happy with current tools (?)
- Discussions.

