Analysis Tools Feedbacks from AWGs
Breco TDBC 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??
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.
A typical analysis: $B^0 \rightarrow c\bar{c}K_S$

- Start with a tight skim (BTC CK _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.