

B meson reconstruction

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3rd PHYSICS OF THE B-FACTORIES WORKSHOP
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- First draft is available on Hypernews of PBF webpage

↪ <http://hypernews.slac.stanford.edu/HyperNews/BFLB/get/AUX/2010/09/30/15.05-2772-pbf-brecon.pdf>

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Introduction section

- Currently short description of the detectors
 - ↔ Q: Do we need description of the detectors?
 - ↔ Perhaps we will benefit from a few well worded sentences describing certain aspects of our detectors that allow us to perform certain tasks.

Methodology and Motivation section

- recoils method are crucial for studying decay modes where decay kinematics can not be fully constrained
- B_{tag} reconstructed semileptonically or hadronically
- overview of the chapter is given
- importance of recoil technique for *Super Flavor Factory (SFF?)* is emphasized

Techniques: Hadronic tag B reconstruction section

- Description of BABAR's semi-exclusive approach to $B \rightarrow D^{(*)} Y$ reconstruction (two versions available at BABAR, only one described)
- Descriptions of Belle's approaches (two versions available at Belle)
 - cut based selection of exclusive modes: $B \rightarrow D^{(*)}(\pi, \rho, a_1, D^{(*)})$
 - neural-net based selection of semi-exclusive modes:
 $B \rightarrow D^{(*)}(K, \pi, 2\pi, 3\pi, 4\pi, D^{(*)})$ and $B \rightarrow J/\psi(K, K\pi, K\pi\pi)$
 - Probably we'll need description of both Belle's versions, since not all results from Belle will be based on the updated version.
 - Sections with results will refer to this section, but which version?
- Typical performance (efficiency) is given for all three cases
 - Plots are missing?
- ΔE , m_{ES} (M_{bc}) variables and Argus function are defined
 - Do we need to define them here? Can we refer to definitions given in previous sections?
- General overview of signal side reconstruction is given

Techniques: Semileptonic tag B reconstruction section

- Description of $B \rightarrow D^{(*)} \ell \nu_\ell$ reconstruction is given
- $\cos\theta_{B,D\ell}$ variable is defined
 - Plots missing?
- Performance is given
- Comparison wrt. hadronic tag B reconstruction is briefly discussed (e.g. impact of loss of ability to determine signal B kinematics)
↪ Plan is to expand the comparison of the semileptonic to hadronic methods.

Techniques: Double Tagging section

- Motivation for performing double tagged analysis is given
 - test of tag B reconstruction efficiency and the description of extra energy in calorimeter
 - Definition of the extra energy is missing.
- 3 classes: semileptonic double-tags, hybrid double-tags and hadronic double tags.
 - description of two approaches testing semileptonic tag B reconstruction efficiency made by BABAR
 - description of test of extra energy distribution with double-tags made by Belle

Is this section in any conflict with sections presenting the results (with tag B related systematics)?

Summary

- Overview of the content of the first draft is given
- Draft is available at:

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- Your impressions, suggestions, comments are most welcome.

Q: Where will the $B \rightarrow D^* l \nu$ partial reco techniques (using soft pion and lepton only to tag) or inclusive *other* B reconstruction used in e.g. $B \rightarrow D^{(*)} \tau \nu$ decays be described? In this section?