B-meson reconstruction

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Reorganization

June   **November**

1. **Introduction**
2. **Methodology and Motivation**
3. **Techniques**
   - Hadronic tag B reconstruction
   - Semileptonic tag B reconstruction
   - Double-tagging

- Chapter no longer devoted only to the recoil B meson reconstruction

Exclusive B-meson reconstruction

- *work in progress*
- ΔE, m_{ES} description/definition from *B-Background discrimination* chapter moved here (written by José Ocariz)
  - example decays: $B^+ \to K_S^0 \pi^+$ and $B^+ \to K^+ \pi^0$
- Missing:
  - general introduction
  - example of $b \to c$ transition; Reconstruction of entire decay chain; Usefulness of mass-constrained fit for D mesons;

Semileptonic and Partial B meson reconstruction

- currently no text

- Semileptonic
    - reconstruction of $B \to DX\ell\nu$ decays described in semileptonic B_{tag} reconstruction $\Rightarrow$ move here
    - description of $B \to X_u\ell\nu$ reconstruction with loose neutrino reconstruction

- Partial
    - $B \to D^*X$
    - $B \to D^*\ell\nu$
    - AZ currently working on it

Recoil *B*-meson reconstruction

- in best shape (close to final)
- Description of three methods:
    - Hadronic
        - two versions at Belle: cut-based selection and NB selection; motivation, comparison in performance given;
        - more than one version at BaBar? If yes, it needs to be added.
    - Semileptonic
    - Inclusive
- quite few modifications made recently (triggered by Soeren's comments)

Feedback from section editors referring to this section is welcome:

- V_{ub} and V_{cb}: Vera Luth, Christoph Schwanda
- Rare, exotic...: Steve Robertson, Youngjoon Kwon
- Leptonic...: Steve Robertson, Toru Iijima

B_{tag} vs. B_{tag}

B_{tag} symbol is problematic since it is used also in B flavor tagging chapter and chapters referring to it. Need to find unambiguous notation (my proposal):

- Flavor tagging: $B_{\mathrm{tag}}^{\mathrm{flav}}$
- B reconstruction: B_{tag} (general) and $B_{\mathrm{tag}}^{\mathrm{hadr}}$, $B_{\mathrm{tag}}^{\mathrm{sl}}$ and $B_{\mathrm{tag}}^{\mathrm{incl}}$ (specific)

Any other proposals?

Summary

Status:

- 10 pages, 6 figures, 1 table
- due to reorganization still quite some work to do
    - expect around 15-20 pages in total
- hopefully ready in December