Contribution ID: **9** Type: **Parallel talk**

Full Reconstruction based on NeuroBayes at the Belle Experiment

Tuesday, 6 September 2011 14:50 (25 minutes)

Full Reconstruction is an important analysis technique utilized at B factories where B mesons are produced in e+e- -> Y(4S) -> BBbar processes. By reconstructing one of the two B mesons in an event fully in a hadronic final state, the properties of the other B meson are determined using momentum conservation. Therefore, it allows to measure or perform searches for rare B meson decays involving one or more neutrinos in the final state.

This ansatz is complicated in practice by huge combinatorics and large amounts of background. With over 1000 exclusively reconstructed B decay channels the Full Reconstruction utilizes a hierachical reconstruction procedure and probabilistic calculus instead of classical selection cuts. In this approach, the decision to accept or reject a candidate is delayed to a later stage in order to make the most use of all available information. The multivariate analysis software package NeuroBayes was used extensively to hold the balance between highest possible efficiency and acceptable consumption of CPU time.

As a result of applying this ansatz, the number of fully reconstructed B mesons was increased by a factor of 2 after 10 years of successful data taking. The new full reconstruction algorithm will thus allow for more precise measurements of rare B meson decays.

Primary authors: Dr ZUPANC, Anze (Karlsruhe Institute of Technology); ZANDER, Daniel (Karlsruhe Institute of Technology); Prof. FEINDT, Michael (Karlsruhe Institute of Technology); Mr NEUBAUER, Sebastian (Karlsruhe Institute of Technology); Dr KUHR, Thomas (Karlsruhe Institute of Technology)

Presenter: ZANDER, Daniel (Karlsruhe Institute of Technology)

Session Classification: Tuesday 06th - Data Analysis –Algorithms and Tools

Track Classification: Track 2 : Data Analysis - Algorithms and Tools