Beauty via Electron Displaced Vertex Tagging

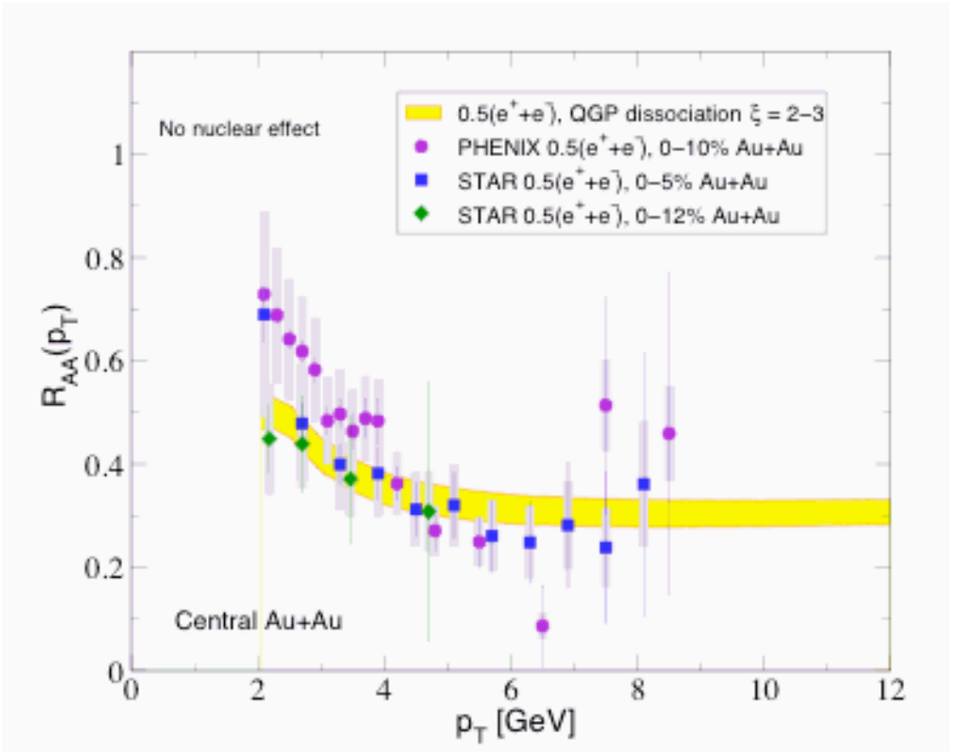
MinJung Kweon
Physikalisches Institut, Universität Heidelberg

06 May 2009, FSP Meeting, Rauischholzhausen

Physics Motivation for beauty and beauty-Jet

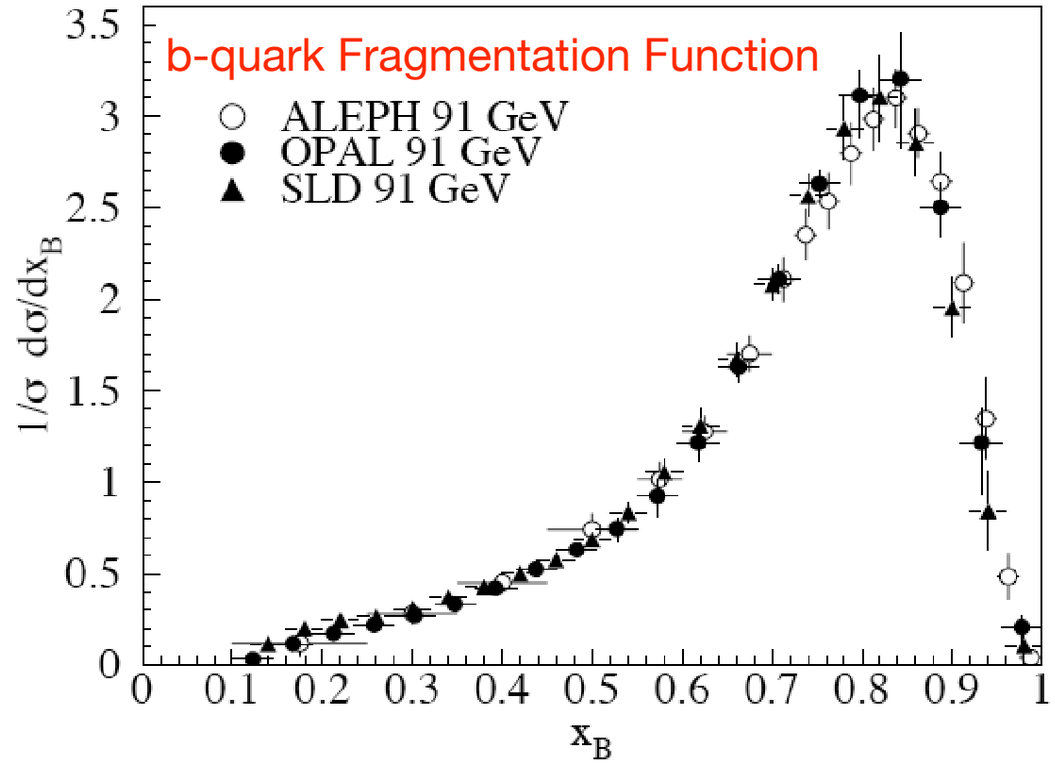
In p+p

- Measure heavy flavor cross section
- Understand heavy flavor production mechanism

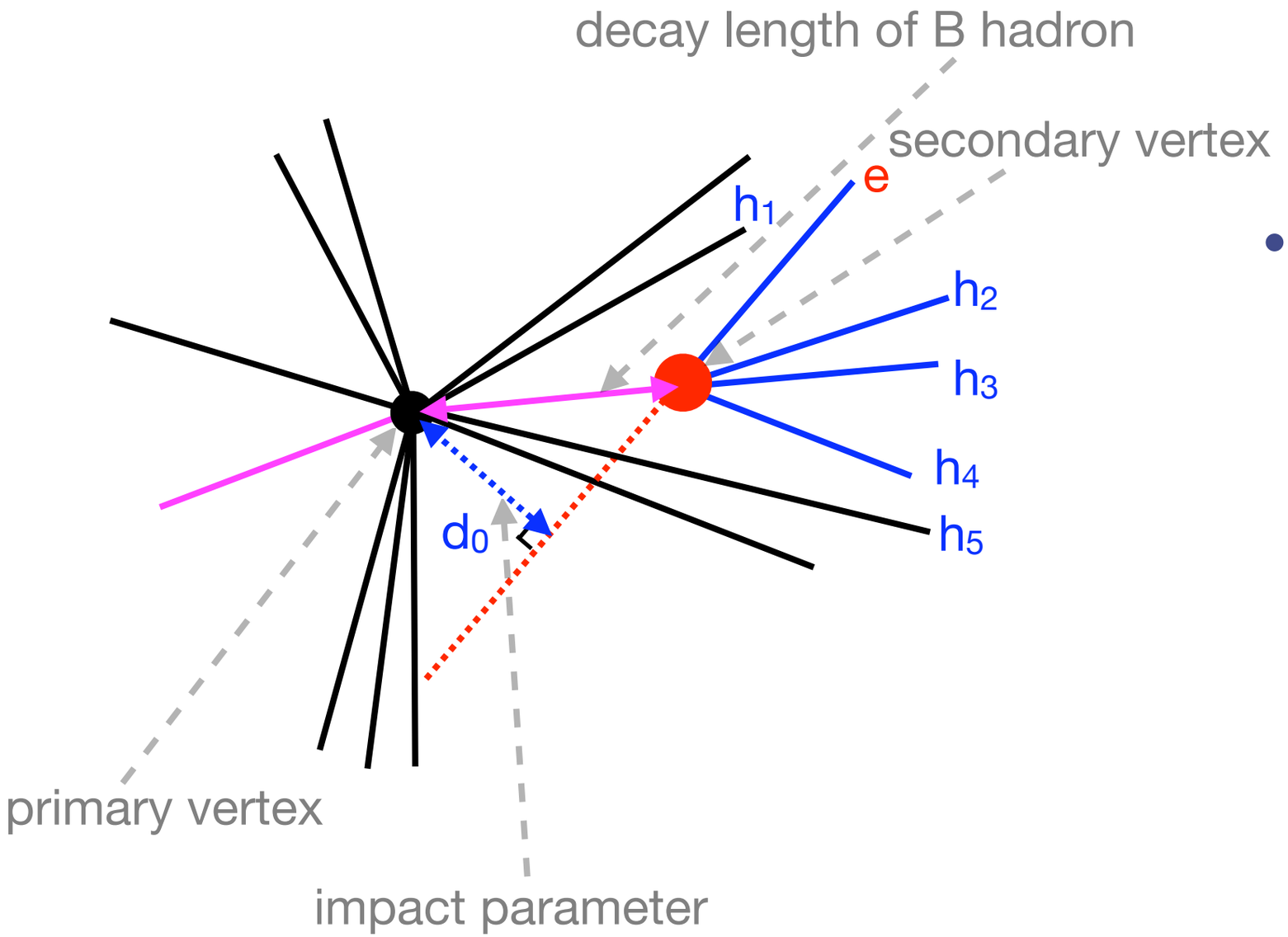


In Heavy Ion

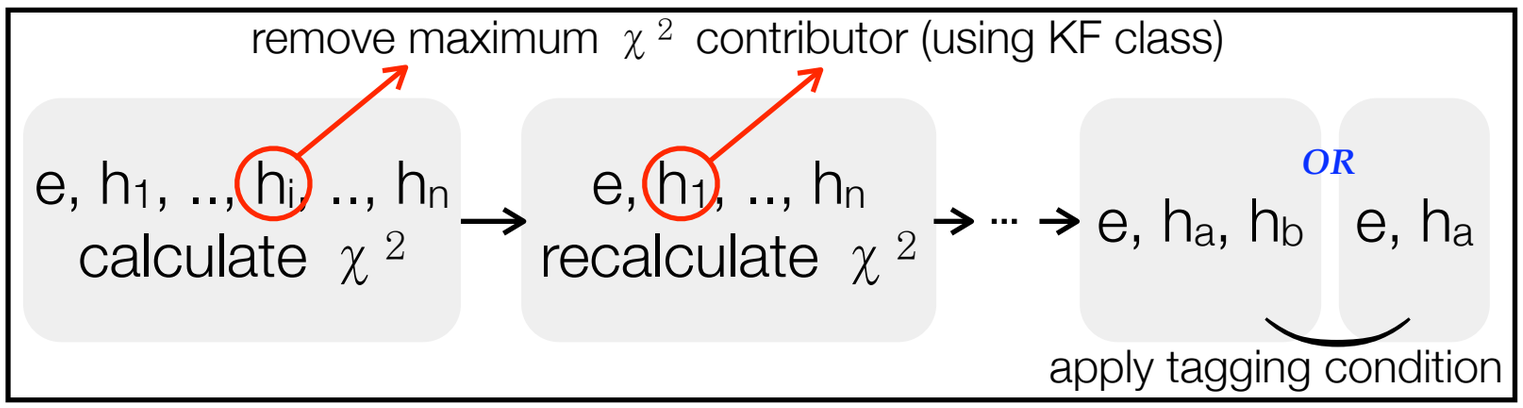
- Investigate energy loss mechanism of heavy quarks in the medium
- Study energy loss for quark vs. gluon jets
- Determine heavy flavor jet fragmentation function in the medium



Beauty Tagging using Secondary Vertexing



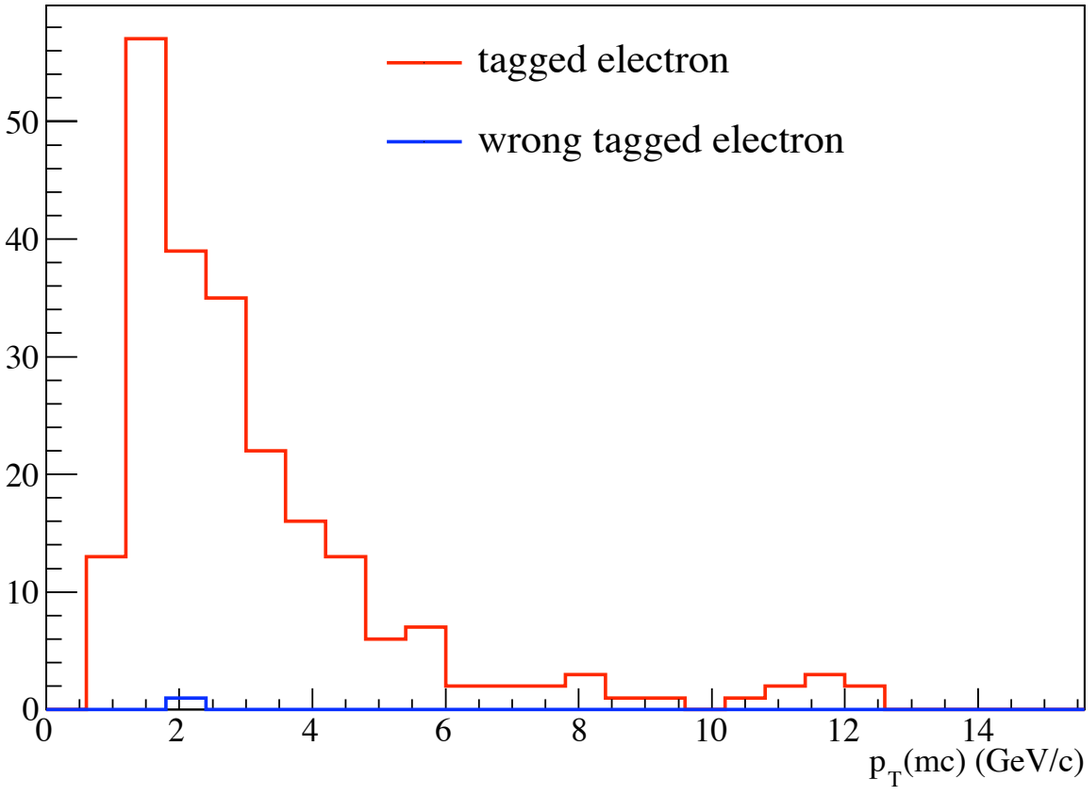
- Secondary vertex reconstruction of beauty decay through electron + hadrons
  - high rate of lepton production from semi-leptonic decay (~11%[b→e] + 10%[b→c→e])
  - long life time (~ 500 μm)
  - large mass (~ 5 GeV/c^2)
  - decay multiplicity

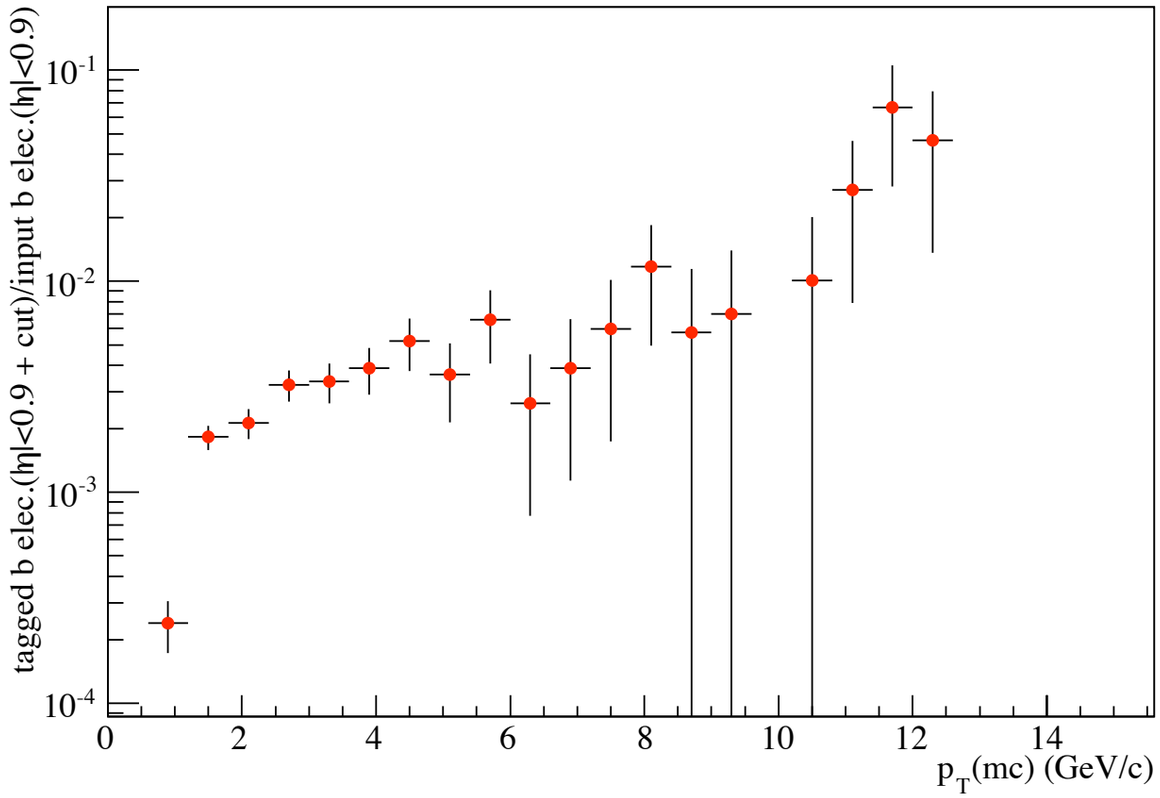


- Analysis procedure
  - single track selection
  - e-h_i pair selection
  - construct secondary vertex and apply tagging condition

Status and Outlook

- True/False b-Tagging and tagging efficiency (done with beauty triggered sample)





- Further understanding on:
  - Tagging efficiency and purity
  - Discriminating variables (mass at secondary vertex, signed decay length, etc.)
- Approach to b-Jet tagging
  - Secondary vertexing with jet associated tracks
  - Require topological constraint between jet axis and secondary vertex