

Charm physics interests @ QM

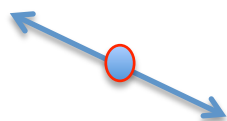
Magnetic field

- $B=1.5\text{T}$ for running at the $\Upsilon(4S)$
- CLEO-c and BES III run at 1T for threshold.
 - Will look at interplay with [Daniel O'Hanlon](#) has joined us for the summer to study the effect of the B-field strength on signal reconstruction efficiency.
 - boost if we see a large effect (consistency check with other ongoing studies)
 - Also want to look at backgrounds.
 - Do we have a generic $D^0/D^\pm$ DEC file at threshold?
 - What other backgrounds should we worry about?
 - [need to look at what Kosta did as a starting point]

TDCPV

- Adrian, Gianluca and Brian worked on outline of measuring asymmetries at threshold and the 4S. See arXiv:1106.5075.
 - Gianluca is starting to follow up on this with FastSim analyses (for his thesis):
 - D decays to $\pi\pi$ and KK final states, to validate sensitivity to $\beta_{c,eff}$.
 - In addition to Monte Carlo sensitivity studies, plan to start looking at systematic limitations of these measurements.

Semi-leptonic /
Kaon tagged

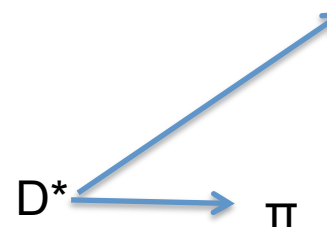


h^+h^- final state

Threshold measurement

vs.

h^+h^- final state



$Y(4S)$

- Initial plan:
 - Refine understanding of D^* tagged $D \rightarrow hh$ at 4S to compare efficiency with expectation from BaBar.
 - Use hh selection (assume common for both studies) with SL and K tagged samples at threshold.
 - Breakdown sample into different tagged categories of event as with the B^0 TDCPV measurements at the 4S.
 - Develop understanding of tagging performance
 - Compare resolutions obtained with double tag studies being performed elsewhere (c.f. other studies in this area)
 - Compare with the 4S sample.

- Subsequent work:
 - Having understood the selection, one needs to perform a time-dependent analysis:
 - Develop fitter for simultaneous time-dependent fit
 - fit for common mixing contribution in $\pi\pi$ and KK , and weak phase for $\pi\pi$.
 - Study systematic uncertainties: resolution function, tracking uncertainties, boost etc.
- In parallel (with UC), the QM group plans to work on penguin pollution and a few other phenomenological ideas over the coming year.