CLEO-c quantum-tagged D→$K_S\pi\pi$ results for γ: status and next steps

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Status of $K_S \pi\pi$ (and $K_L \pi\pi$) Analysis

CLEO-c analysis based on implementation of BaBar model from PRL 95 (2005) 121802 (not the most recent!).

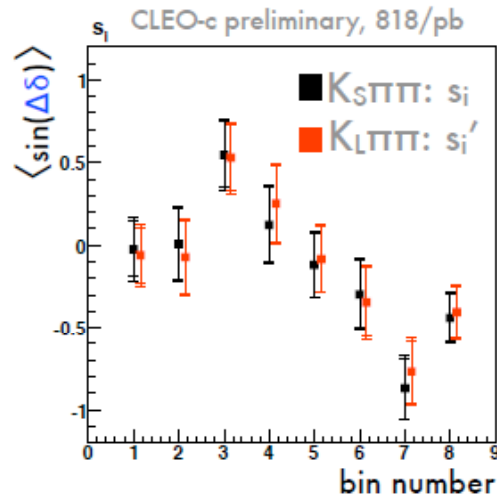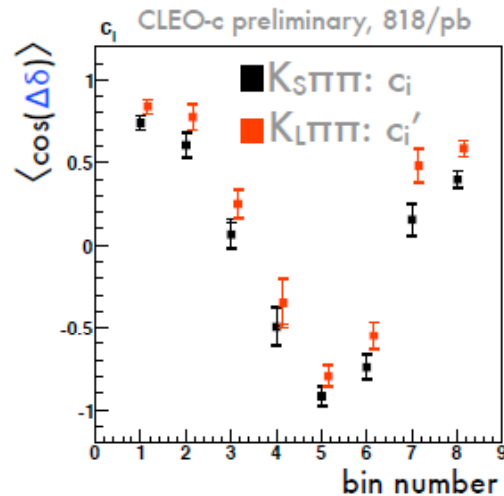Tag statistics from 818 fb^{-1} at $\psi(3770)$:

- ~780 CP tagged $K_S \pi\pi$
- ~420 $K_S \pi\pi$ vs $K_S \pi\pi$
- ~840 CP tagged $K_L \pi\pi$
- ~870 $K_S \pi\pi$ vs $K_L \pi\pi$

8 equally separated bins chosen in $\Delta\delta_D$. Systematics assigned to account for $K_S \pi\pi$ vs $K_L \pi\pi$ differences. Results given for c_i and s_i plus correlation matrix.

Status: results essentially same as Jonas presented at CKM 08.

Paper draft now in advanced stage and soon to be submitted to PRD.

Principal analyst (Qing He) leaving CLEO within month.

The Result

CLEO-c preliminary, 818/pb
$K_S\pi\pi$: c_i
$K_L\pi\pi$: c_i'

CLEO-c preliminary, 818/pb
$K_S\pi\pi$: s_i
$K_L\pi\pi$: s_i'

- Results of combined fit in terms of c_i, s_i in $K_S\pi\pi$ and c_i', s_i' in $K_L\pi\pi$.

- Each series of results (black/red) contains full information from both $K_S\pi\pi$ and $K_L\pi\pi$ data, related by Δc_i, Δs_i.

- Fit errors (include $\sigma_{statistical} \oplus$ errors on Δc_i, Δs_i constraints):
  c_i: 0.04-0.11
  c_i': 0.04-0.14
  s_i: 0.15-0.23
  s_i': 0.16-0.23

- Systematic errors:
  c_i: 0.02-0.06
  c_i': 0.02-0.07
  s_i: 0.04-0.10
  s_i': 0.06-0.10

We estimate residual error on γ from c_i, s_i uncertainties to be ~2°

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Requirements and Possible Way Forward

Soon-to-be-published results possibly not ideal for everyone because:

- BaBar maybe prefer state-of-the-art model
- Belle maybe prefers to use its own model
- Maybe we all (especially LHCb) want to try binning which optimises overall precision (Alex and Anton 'optimal binning')

Would be nice to have c_i's and s_i's calculated for these variants

It *may* be possible for CLEO to find manpower to do this. We will discuss.

Rather than ask CLEO to implement new models, we propose that experiments (+ Alex & Anton) provide bitmaps which define bins.
(We need to decide on format and resolution for these bitmaps. As well as bin boundaries, perhaps δ_D value can also be added?)

Today decide for which bin variants we want results calculated and upon a timescale for the bitmaps to be sent to CLEO.

Schedule a (monthly) meeting (under the HFAG umbrella?) to motivate and monitor progress on implementing CLEO-c results in γ/ϕ_3 analyses