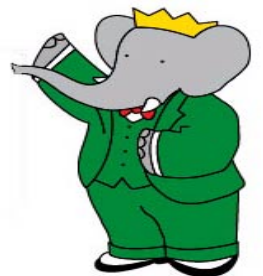


$B \rightarrow K_S \pi^0(\gamma)$ & SVT outer radius: updated study

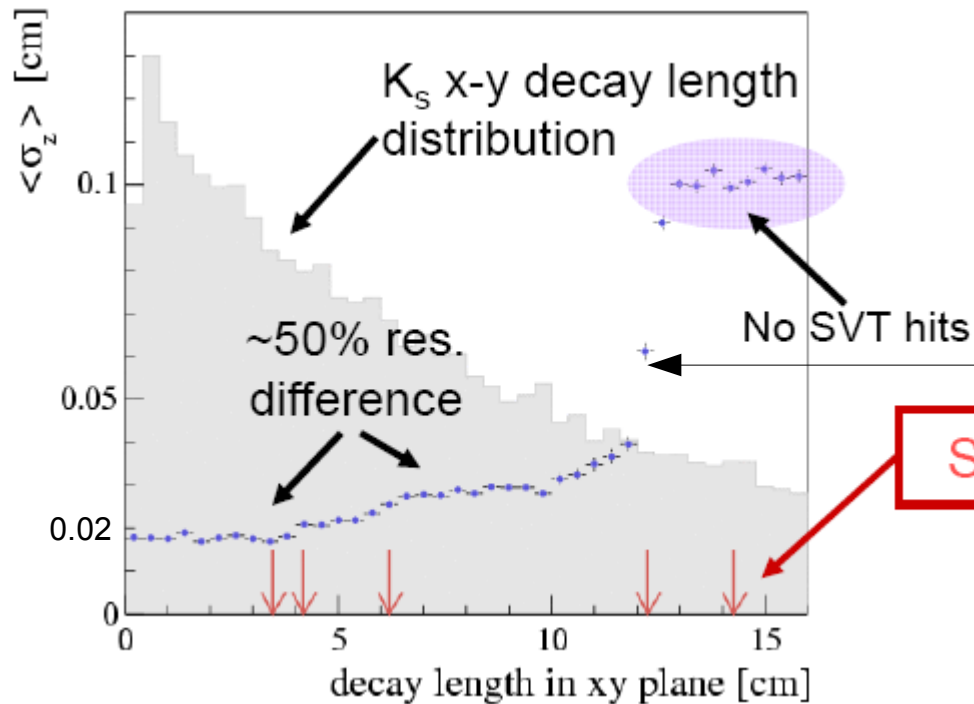
Gabriele Simi
(University of Maryland)



Outline

- New SVT configuration: L0 and acceptance
- Estimate the error on S
 - Δz resolutions for baseline as similar as BaBar but dt resolution is worse
 - Expanded SVT: fraction of usable KS for time dependent study increases

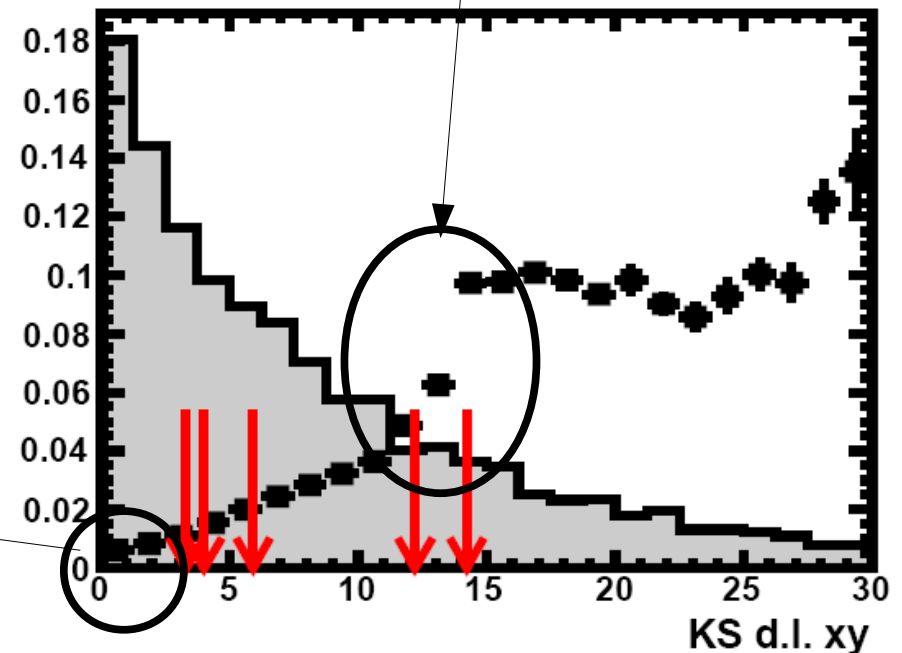
Resolution vs f.t. In BaBar



Resolution depends on number of SVT layers traversed by pions from K_S ...

Pattern Recognition:
Tracks with only one SVT hit where not found in BaBar

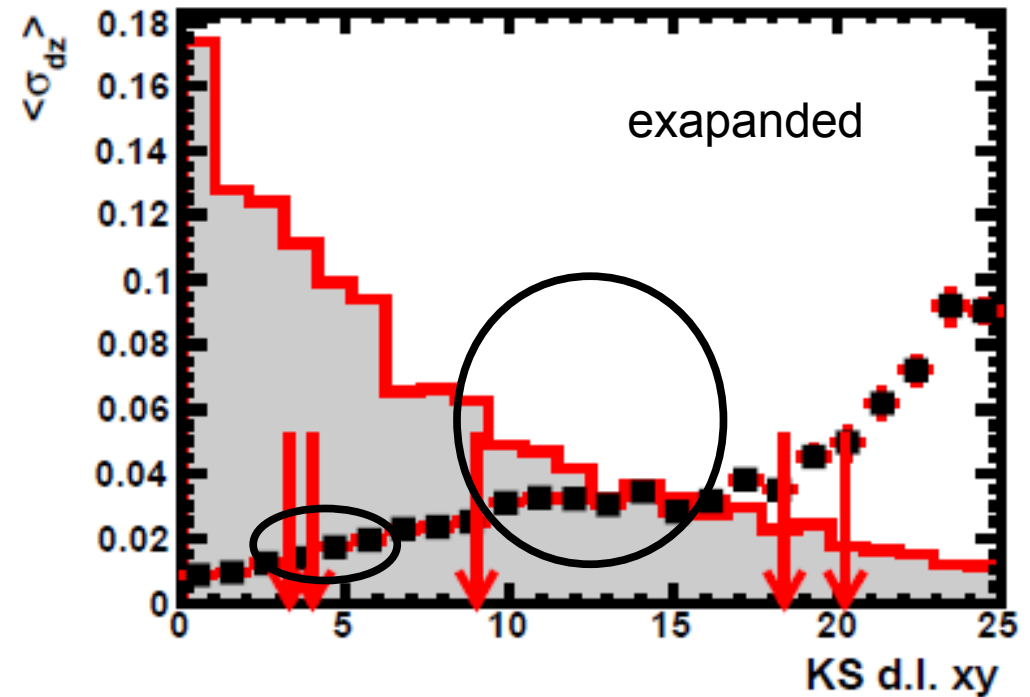
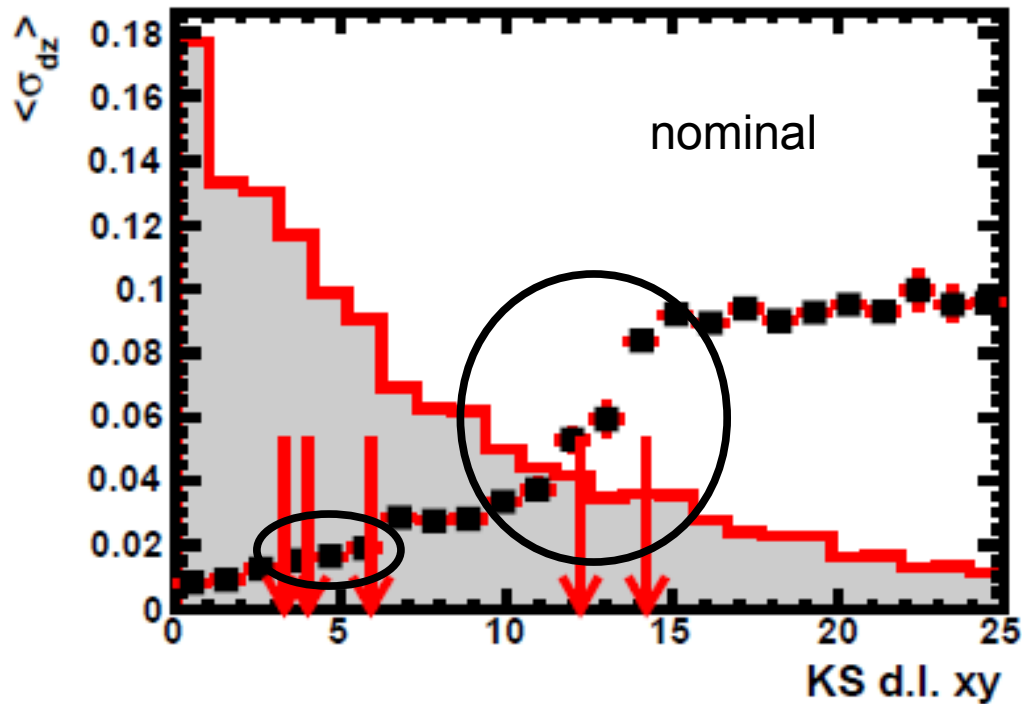
- Better resolution close to the IP because of layer0



Baseline and expanded configurations

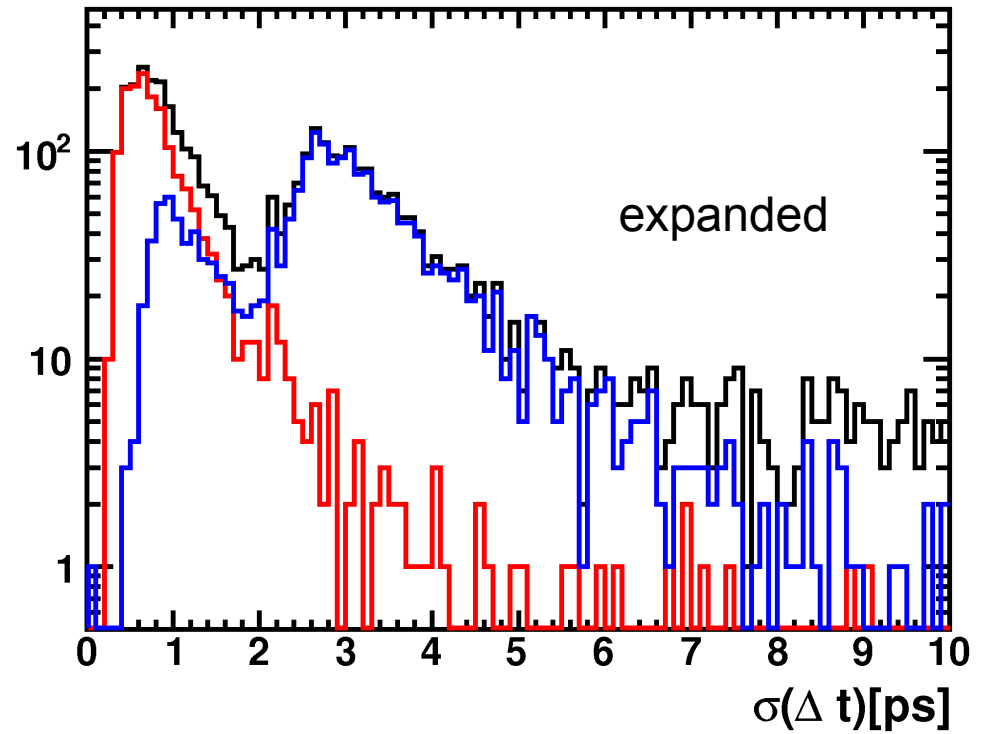
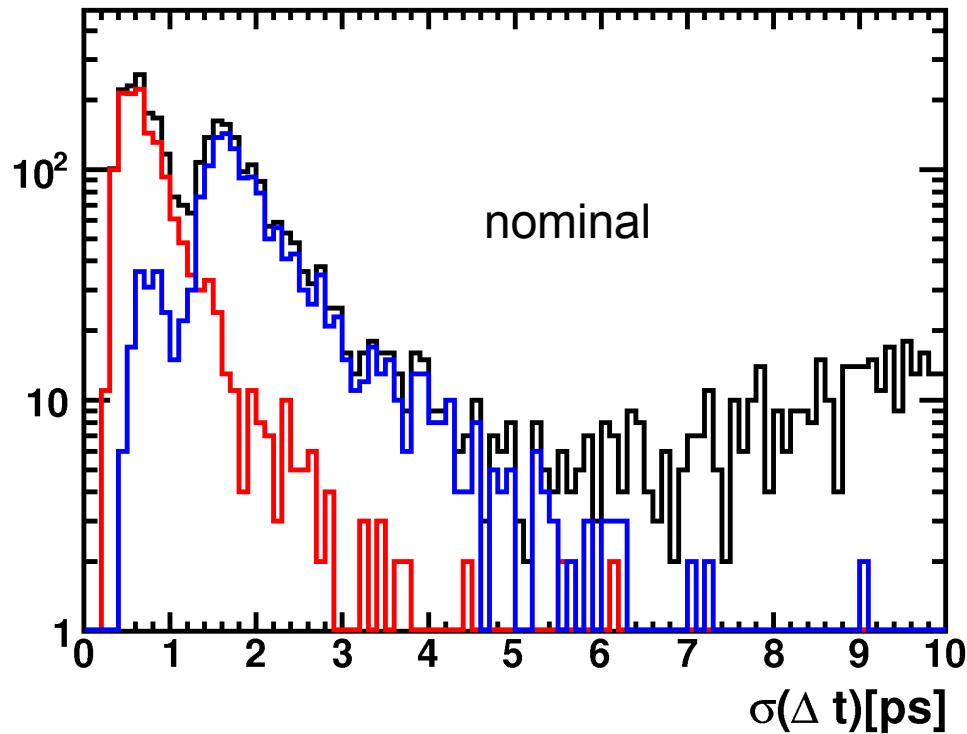
- Baseline SVT configuration as implemented by Nicola
 - L0 is now the hybrid pixel solution
 - Angular coverage increased down to 300mrad
 - Geometric acceptance goes from 89% to 95%
- Expanded configuration: L45 and L3 [N.Neri]
 - Layer 3: 5.9-> 9.4
 - Layer 4: 12.2->20.6
 - Layer 5: 14.2->22.6 (DCH S.T. is at 23.6cm)

Filling the gap between SVT and DCH



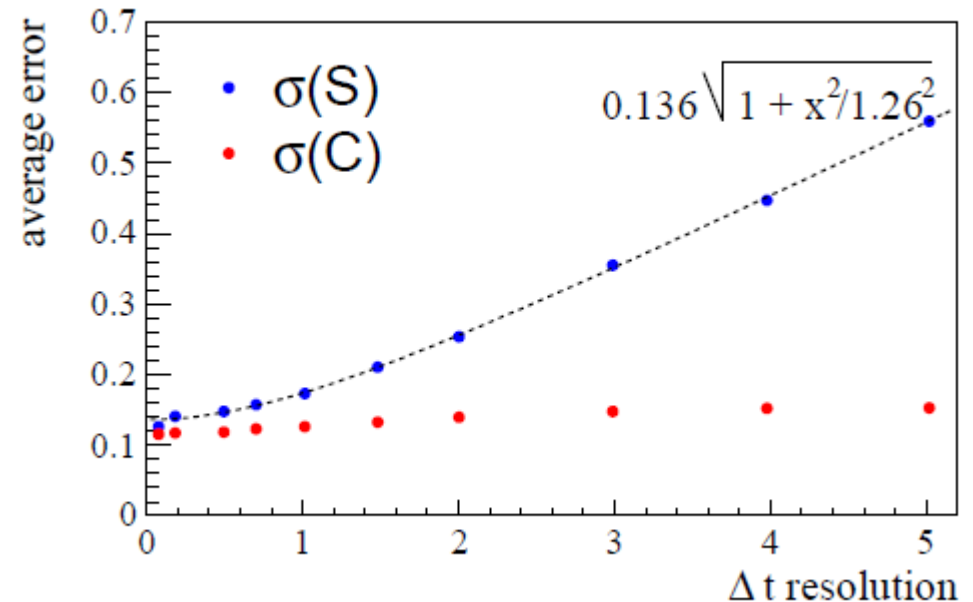
Events used in Δt fit for S

- | | Nominal | expanded |
|---------------------------------|----------|----------|
| • Class I & II: used for dt fit | 72% | 88% |
| • | [was 63% | 73%] |



Sensitivity on S,C

- Dependence of S from $\sigma_{\Delta t}$ studied in BAD 904 for perfect tagging

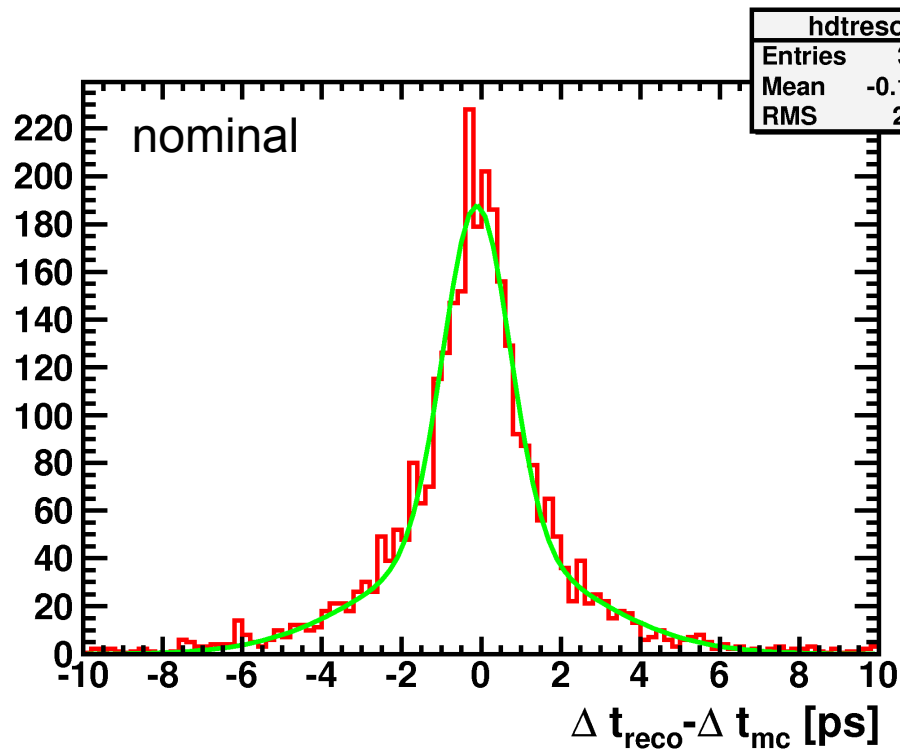


- Useful to compare different configurations assuming the dependence

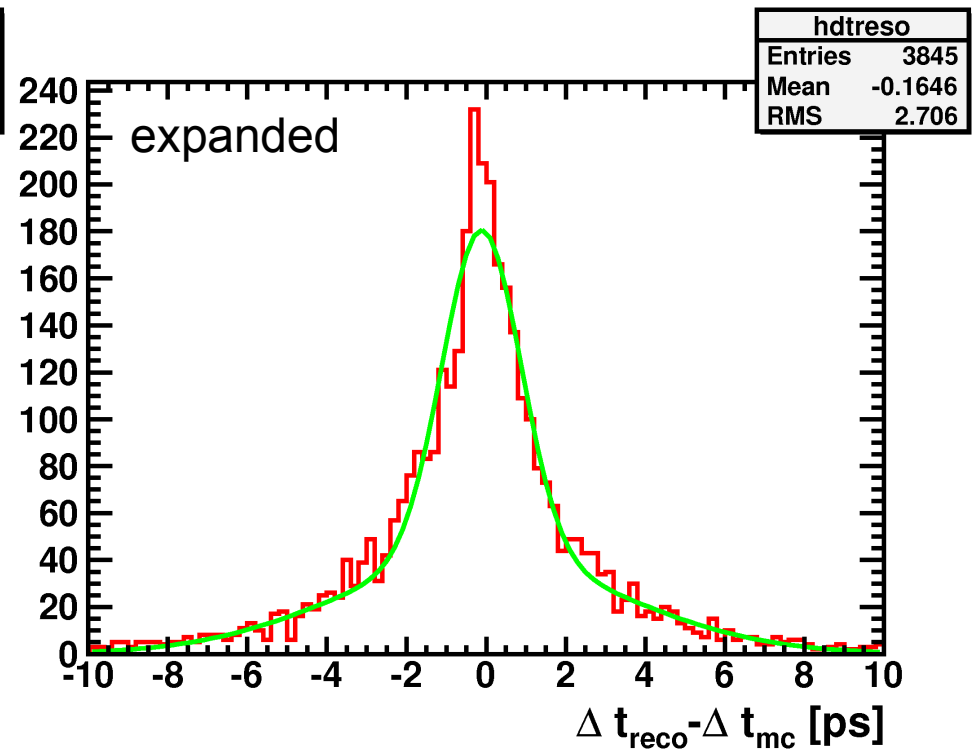
$$- \sigma_S \sim \sqrt{[(1 + \sigma_{\Delta t}^2 / 1.26^2) / f_{\text{good}}]}$$

$$- \sigma_C \sim \sqrt{[1 / \text{eff}]}$$

Δt resolution



r.m.s.=2.19



r.m.s.=2.71

- Babar configuration gives r.m.s.=1.84

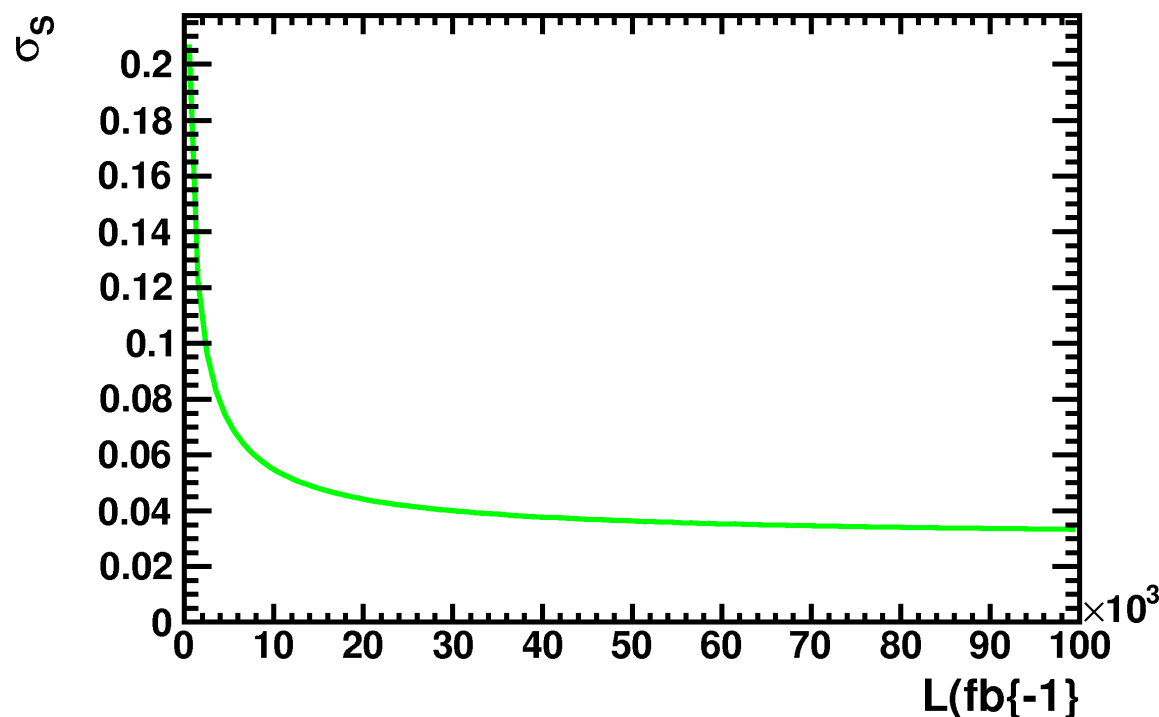
Comparison of Sensitivity on S,C

	rms[ps]	f _{good} [%]	$\sigma_S/\sigma_S^{\text{nominal}}$	$\sigma_C/\sigma_C^{\text{nominal}}$
babar	1.84	69	0.90	0.98
nominal	2.19	72	1	1
expanded	2.71	88	1.07	1.00

- Sensitivity in nominal configuration is comparable to BaBar (10% worse on S)
- Sensitivity in expanded configuration is 10% worse than nominal on S, the same on C

Sensitivity on S for SuperB

- Scale the BaBar result by the luminosity and correct for different resolution, efficiency



	Sys error
Bflav parameters	0.016
Bias correction	0.011
Input PDF params	0.010
SVT alignment	0.009
Vertexing method	0.008

Summary

- Updated study of $K_S\pi^0$ resolutions to baseline SVT configuration, compared to expanded
- Estimated sensitivity on S
- Indication of no gain using expanded SVT

Plans

- Update selection
- Implement ML fit of time dependent CPV
- Add $K^*\gamma$