Intro

- Aim: Measuring $A_{FB}^{b\bar{b}}$ using charged kaons

  Asymmetry for kaons coming from b($\bar{b}$:)

$$A_K(\vartheta) = \frac{N_{K^-}(\vartheta) - N_{K^+}(\vartheta)}{N_{K^-}(\vartheta) + N_{K^+}(\vartheta)}$$

  is connected to the b$\bar{b}$ forward-backward asymmetry as:

$$\boxed{A_K(\vartheta) \approx \frac{c_b - w_b}{c_b + w_b} \frac{8}{3} A_{FB}^{b\bar{b}} \frac{\cos\vartheta}{1+\cos^2\vartheta} - \frac{\delta}{2}}$$

  where coefficients are:

$$\frac{c_b - w_b}{c_b + w_b} = \frac{[c^-(\vartheta) + c^+(\vartheta)] - [w^-(\vartheta) + w^+(\vartheta)]}{[c^-(\vartheta) + c^+(\vartheta)] + [w^-(\vartheta) + w^+(\vartheta)]}$$

$$\frac{\delta}{2} = \frac{[c^+(\vartheta) + w^+(\vartheta)] - [c^-(\vartheta) + w^-(\vartheta)]}{[c^+(\vartheta) + w^+(\vartheta)] + [c^-(\vartheta) + w^-(\vartheta)]}.$$

- Method:

  – Non-b$\bar{b}$ contribution determined by using MC is subtracted from the measured number of kaons

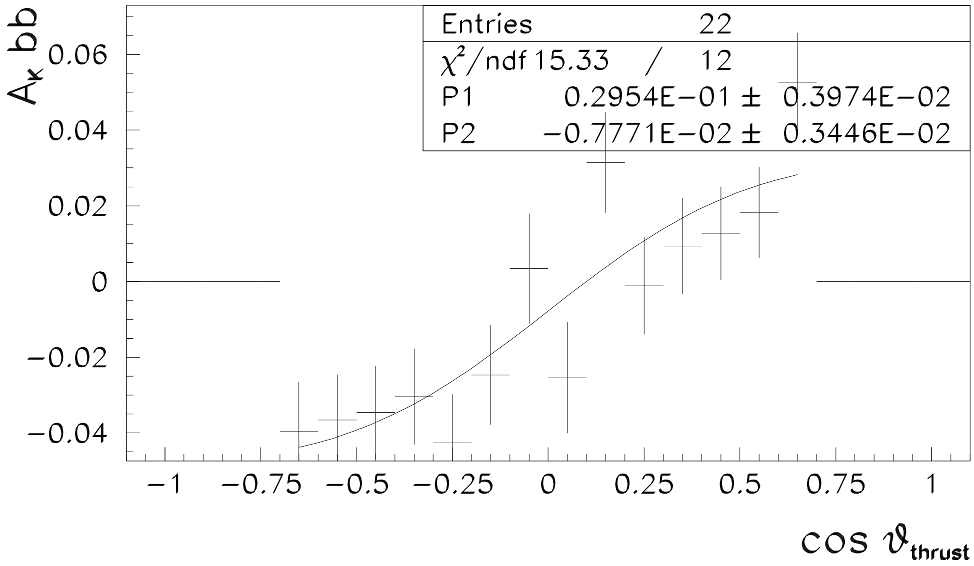
  – Coefficient $\frac{c_b - w_b}{c_b + w_b}$ is determined from data by the double tag:

$$\boxed{\frac{N^{opp}(\vartheta) - N^{like}(\vartheta)}{N^{opp}(\vartheta) + N^{like}(\vartheta)} = \left(\frac{c_b - w_b}{c_b + w_b}\right)^2}$$

  – Measured asymmetry is corrected for the material asymmetry also determined from the selected sample (under the assumption that the material asymmetry is $\cos\vartheta$ symmetric)

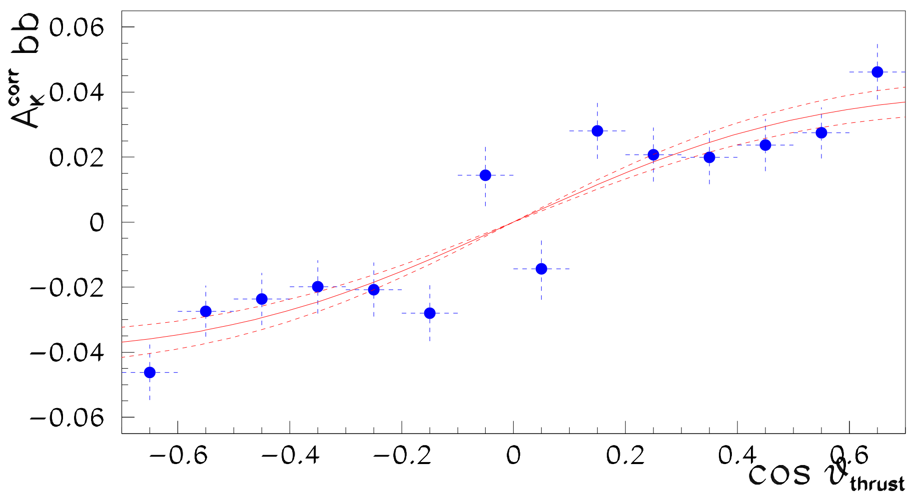
- New ratio: 1994 data

$$A_{\mathrm{K}}(\vartheta) = \frac{N_{\mathrm{K}^-}(\vartheta) - N_{\mathrm{K}^+}(\vartheta)}{N_{\mathrm{K}^-}(\vartheta) + N_{\mathrm{K}^+}(\vartheta)}$$



$$A_{\mathrm{K}}{}^{corr}(\vartheta) = \frac{N_{\mathrm{K}^-}(\vartheta) - N_{\mathrm{K}^+}(\vartheta)}{N_{\mathrm{K}^-}(\vartheta) + N_{\mathrm{K}^+}(\vartheta)}$$

$$+\frac{(N_{\mathrm{K}^+}(\vartheta) + N_{\mathrm{K}^+}(\vartheta+\pi)) - (N_{\mathrm{K}^-}(\vartheta) + N_{\mathrm{K}^-}(\vartheta+\pi))}{(N_{\mathrm{K}^+}(\vartheta) + N_{\mathrm{K}^+}(\vartheta+\pi)) + (N_{\mathrm{K}^-}(\vartheta) + N_{\mathrm{K}^-}(\vartheta+\pi))}$$



Results

- Measured values:

Year	Type of data	$A_{FB}^{\mathrm{b\bar{b}}}$	comment
1992	Z^0peak	0.116 ± 0.030	combined HADSIGN used!
	Z^0peak - 2	0.023 ± 0.068	peak value for η!
1993	Z^0peak	0.121 ± 0.041	combined HADSIGN used!
	Z^0peak + 2	0.119 ± 0.061	
1994	Z^0peak	0.105 ± 0.015	expected significance!
	Z^0peak - 2	0.106 ± 0.084	peak values for η!
1995	Z^0peak	0.091 ± 0.025	expected significance
	Z^0peak + 2	0.092 ± 0.065	for peak!

- Combined values:

Type of data	All years
Z^0peak - 2	0.056 ± 0.053
Z^0peak	0.105 ± 0.011
Z^0peak + 2	0.106 ± 0.044