

Detector induced assymetry in CP violation measurements

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- very small errors in $D = \frac{\epsilon_+ - \epsilon_-}{\epsilon_+ + \epsilon_-}$
 $\rightarrow D = 0$ out of 5σ -range
- smaller error for *UP*-polarity due to higher statistics
- no difference between *UP* and *DOWN* within scope of the error
- in the MC: $\epsilon_{D^*} = 0$ (*Dst_reconstructed* always 0)
in our computation: $\epsilon_{D^*} = \epsilon_{\pi,S} \cdot \epsilon_{D^0}$

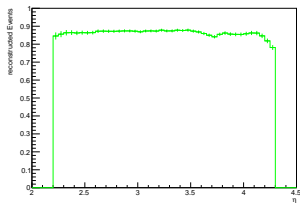
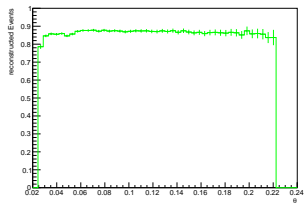
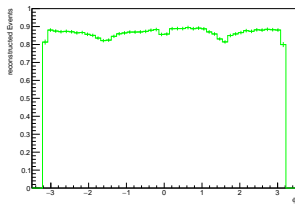
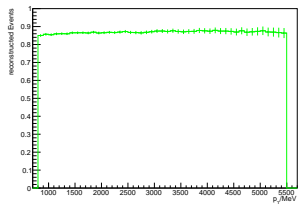
- structure of $\epsilon(\phi)$ probably due to rectangular detector shape
- huge errorbars are due to under-/overflow bins
- peak in $\epsilon_{D^*}(\theta)$ may also be caused by this
 - within range of error peak could also be flat

Total

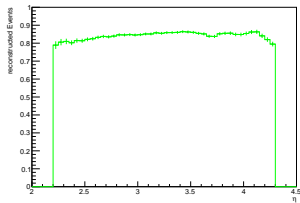
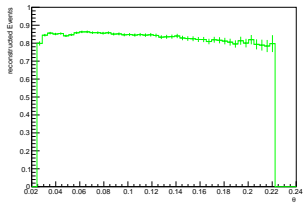
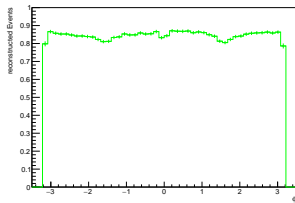
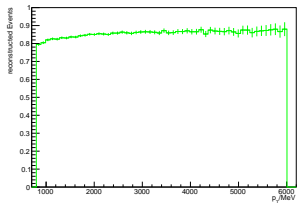
Efficiencies

Polarity	ϵ_{π}	ϵ_K	$\epsilon_{\pi,s}$	ϵ_{D^0}	ϵ_{D^*}
<i>UP</i>	86.61 ± 0.04	84.65 ± 0.04	76.61 ± 0.05	73.33 ± 0.05	56.26 ± 0.06
<i>DOWN</i>	86.61 ± 0.04	84.67 ± 0.05	76.54 ± 0.06	73.33 ± 0.06	56.23 ± 0.07

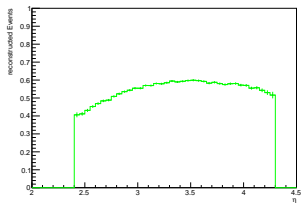
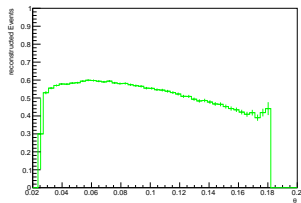
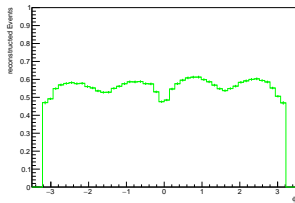
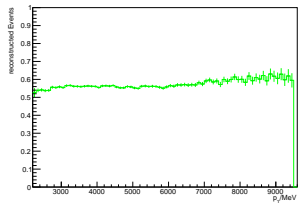
π -efficiency



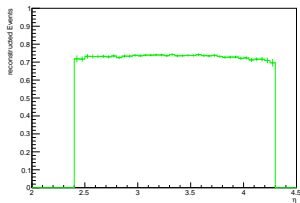
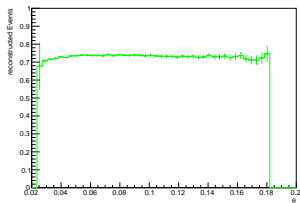
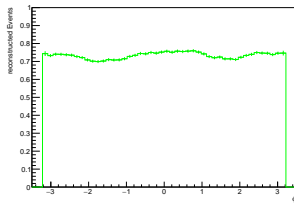
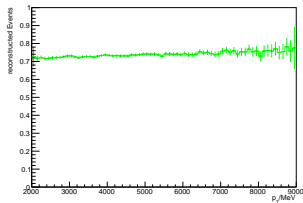
K-efficiency



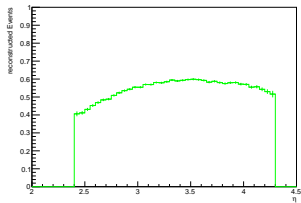
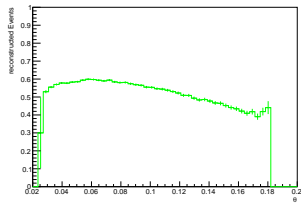
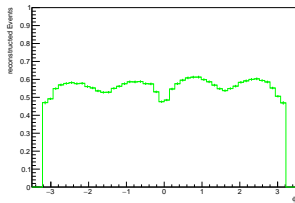
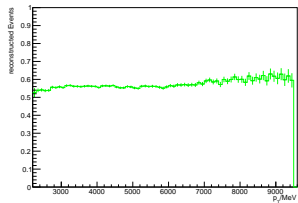
soft π -efficiency



D^0 -efficiency



D^* -efficiency

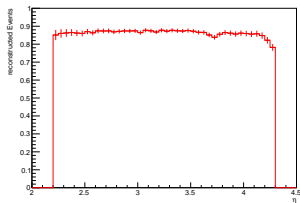
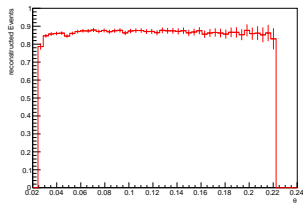
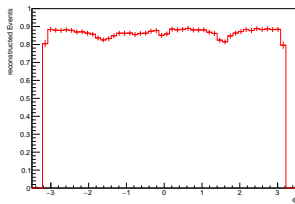
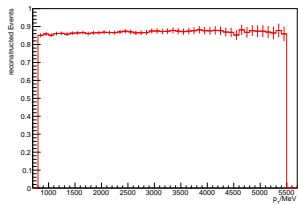


Charge: +

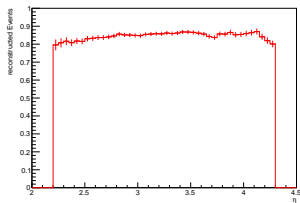
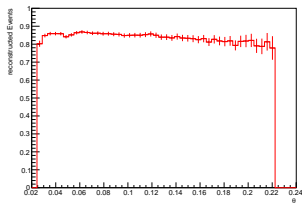
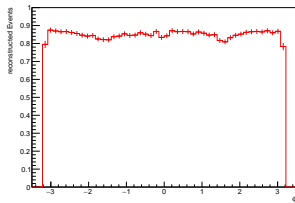
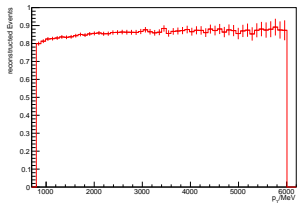
Efficiencies

Polarity	ϵ_{π}	ϵ_K	$\epsilon_{\pi,s}$	ϵ_{D^0}	ϵ_{D^*}
<i>UP</i>	86.63 ± 0.06	85.01 ± 0.06	76.26 ± 0.07	73.00 ± 0.07	55.71 ± 0.08
<i>DOWN</i>	86.57 ± 0.06	85.38 ± 0.07	76.71 ± 0.08	72.92 ± 0.08	56.09 ± 0.09

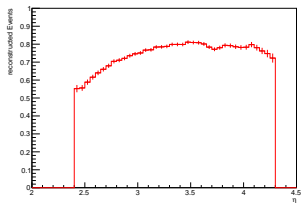
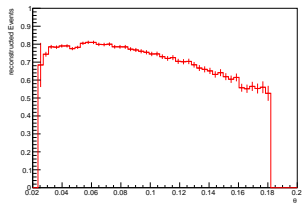
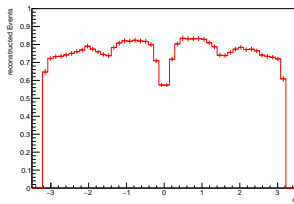
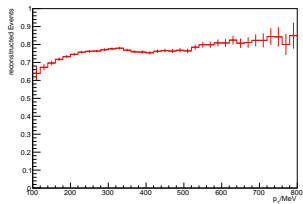
π -efficiency



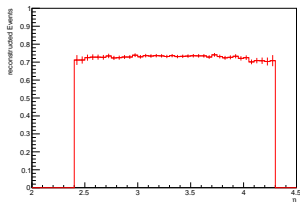
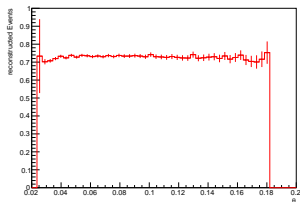
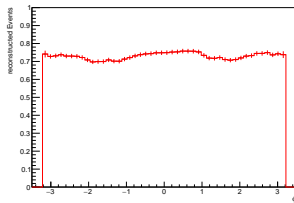
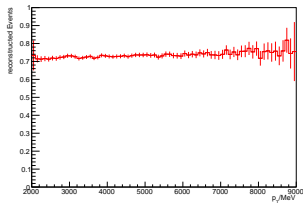
K-efficiency



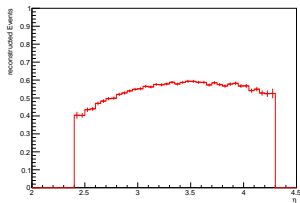
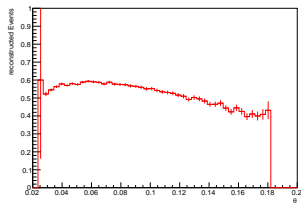
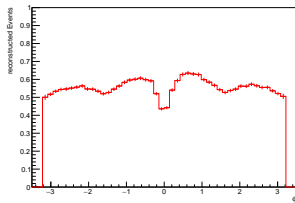
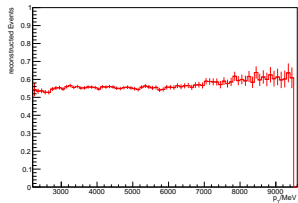
soft π -efficiency



D^0 -efficiency



D^* -efficiency

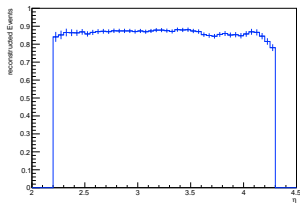
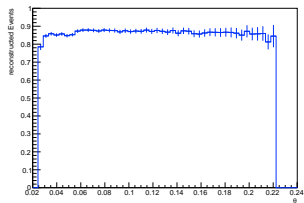
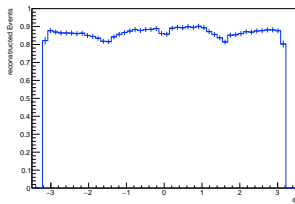
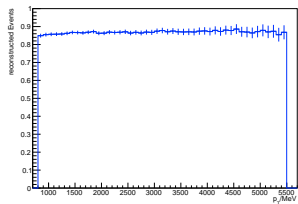


Charge: -

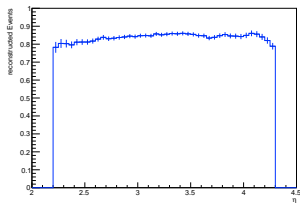
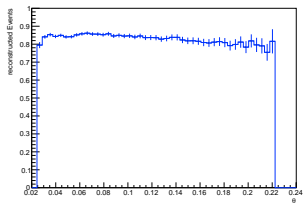
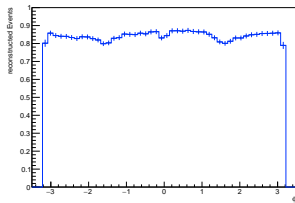
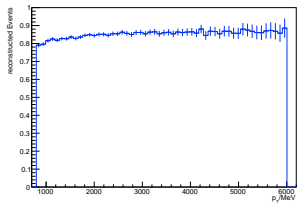
Efficiencies

Polarity	ϵ_{π}	ϵ_K	$\epsilon_{\pi,s}$	ϵ_{D^0}	ϵ_{D^*}
<i>UP</i>	86.60 ± 0.06	84.30 ± 0.06	76.97 ± 0.07	73.65 ± 0.07	56.81 ± 0.08
<i>DOWN</i>	86.64 ± 0.06	83.95 ± 0.07	76.36 ± 0.07	73.74 ± 0.08	56.38 ± 0.09

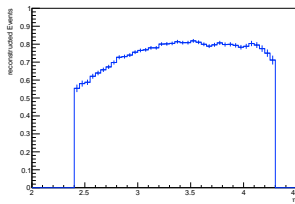
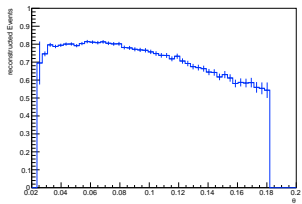
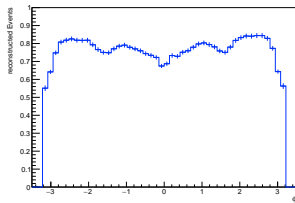
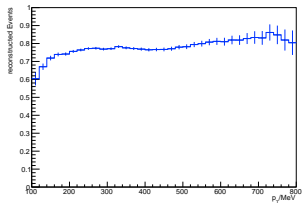
π -efficiency



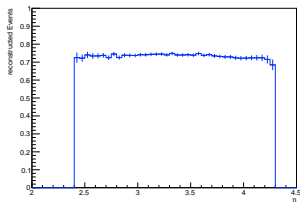
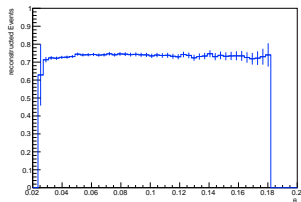
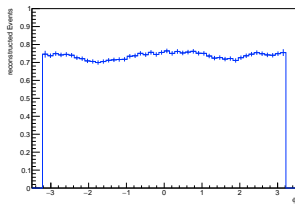
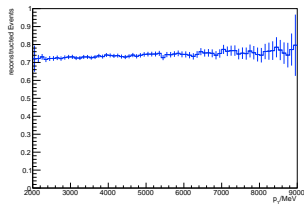
K-efficiency



soft π -efficiency



D^0 -efficiency



D^* -efficiency

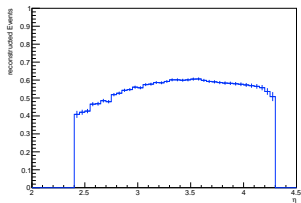
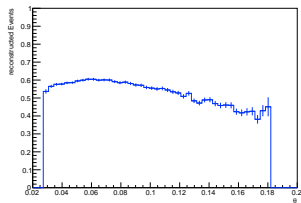
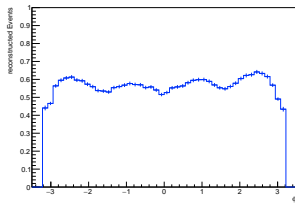
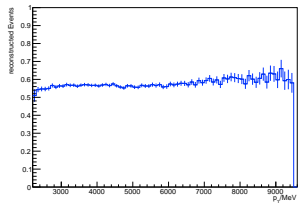
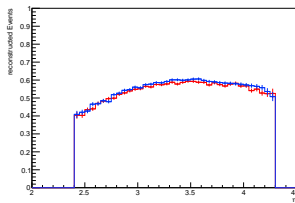
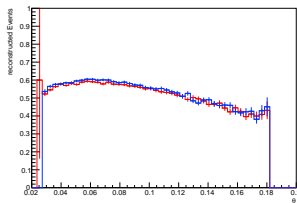
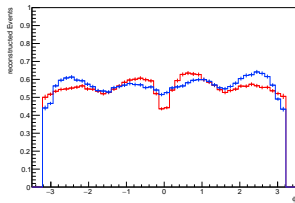
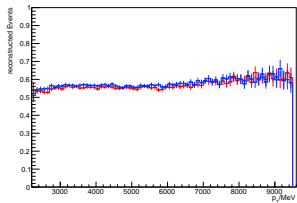


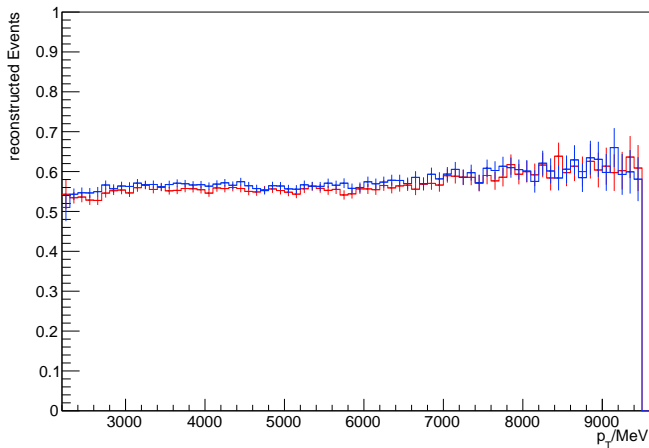
Table: The deviation $\frac{\epsilon_+ - \epsilon_-}{\epsilon_+ + \epsilon_-} / 10^{-3}$

Polarity	π	K	$soft\pi$	D^0	D^*
<i>UP</i>	0.2 ± 0.8	4.0 ± 0.8	-5.0 ± 1.0	-4.0 ± 1.0	-9.8 ± 1.1
<i>DOWN</i>	-0.4 ± 0.9	8.0 ± 0.9	2.3 ± 1.1	-6.0 ± 1.2	-2.5 ± 1.3

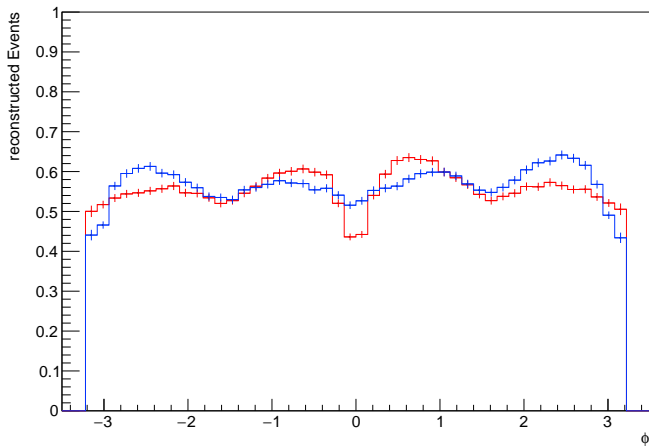
Comparison of different charges - D^*



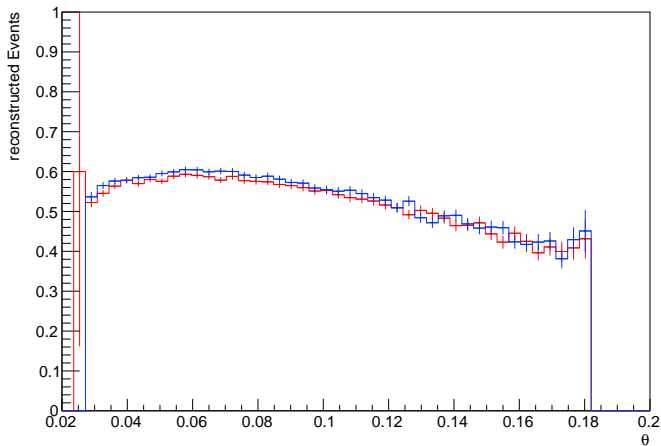
Comparison - $D^* p_T$



Comparison - $D^*\phi$



Comparison - $D^*\theta$



Comparison - $D^*\eta$

