

$$e^+e^- \rightarrow \gamma h$$

# status report



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## 7. Method Validity

We assume no difference between SM and BSM  $\cos \theta_r$  distribution

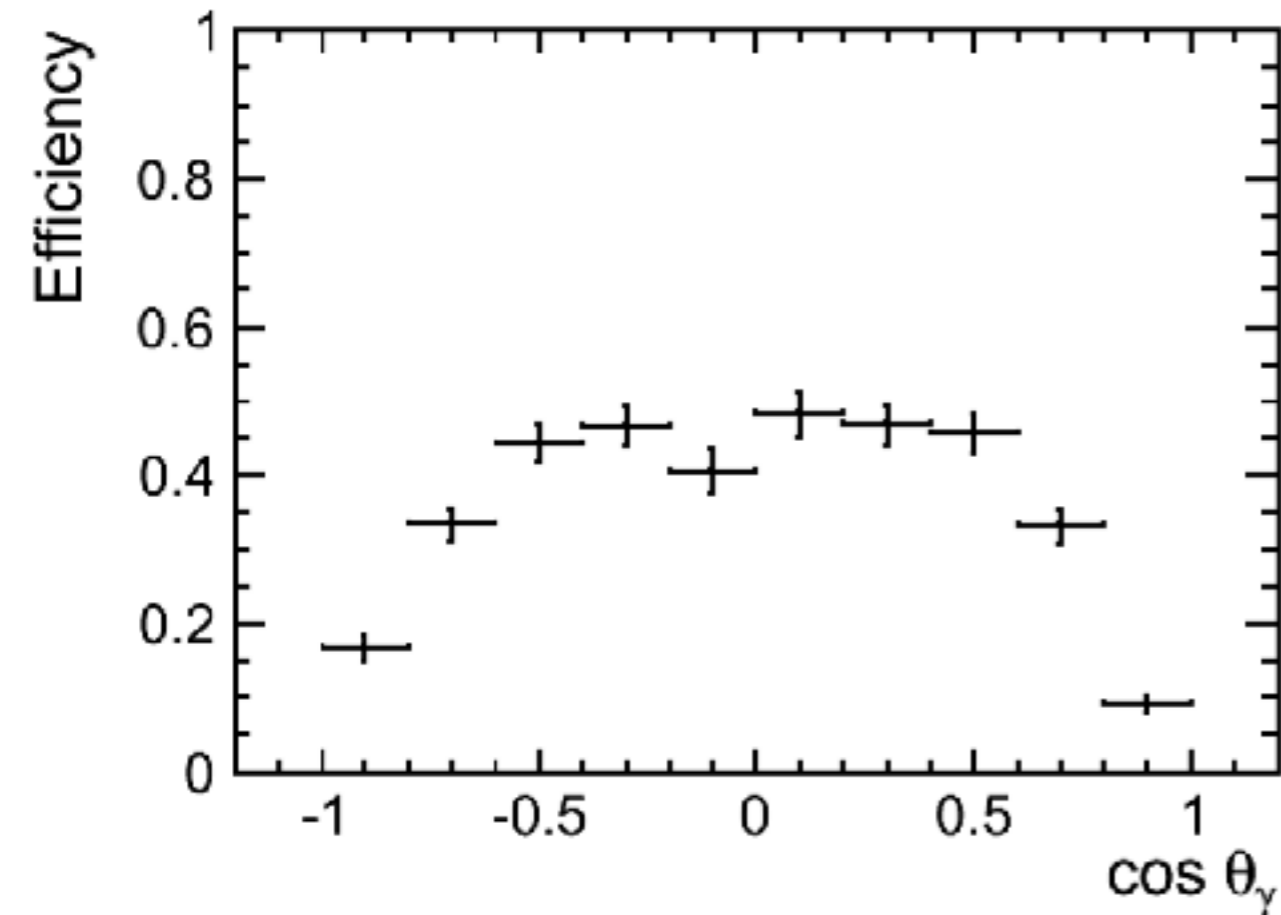
$$d\sigma = \frac{1}{2s\beta} \sum_{s_1, s_2} w_{s_1}, w_{s_2} \underbrace{|T_{SM} + T_{BSM}(\zeta_{AZ}, \zeta_A)|^2}_{|T_{SM}|^2 + 2 \operatorname{Re}(T_{SM}^* T_{BSM}(\zeta_A, \zeta_{AZ})) + \cancel{|T_{BSM}|^2}} d\Phi_2$$

$$\frac{d\sigma}{d \cos \theta} = \frac{d\sigma_{SM}}{d \cos \theta} + \zeta_A \frac{d\sigma_{BSM}}{d \cos \theta} (\zeta_A = 1, \zeta_{AZ} = 0) + \zeta_{AZ} \frac{d\sigma_{BSM}}{d \cos \theta} (\zeta_A = 0, \zeta_{AZ} = 1)$$

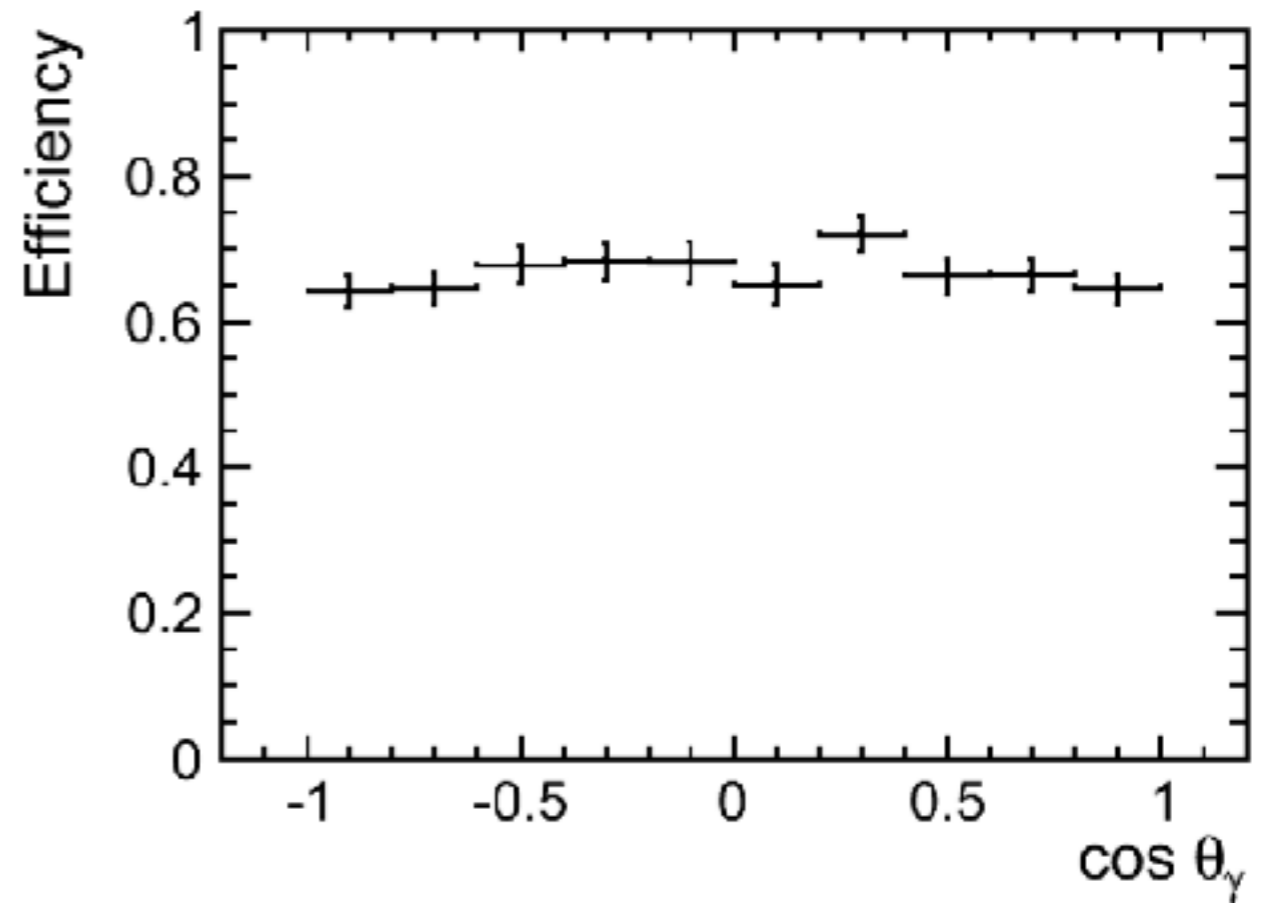
$$\begin{aligned} N &= \mathcal{L} \int \frac{d\sigma}{d \cos \theta} \eta(\cos \theta) d \cos \theta \\ &= \mathcal{L} \left[ \int \frac{d\sigma_{SM}}{d \cos \theta} \eta(\cos \theta) d \cos \theta + \int \frac{d\sigma_{BSM}}{d \cos \theta} (\zeta_A = 1, \zeta_{AZ} = 0) \eta(\cos \theta) d \cos \theta \zeta_A - \right. \\ &\quad \left. + \int \frac{d\sigma_{BSM}}{d \cos \theta} (\zeta_A = 0, \zeta_{AZ} = 1) \eta(\cos \theta) d \cos \theta \zeta_{AZ} \right] \end{aligned}$$

# $\cos\theta_\gamma$ Distribution

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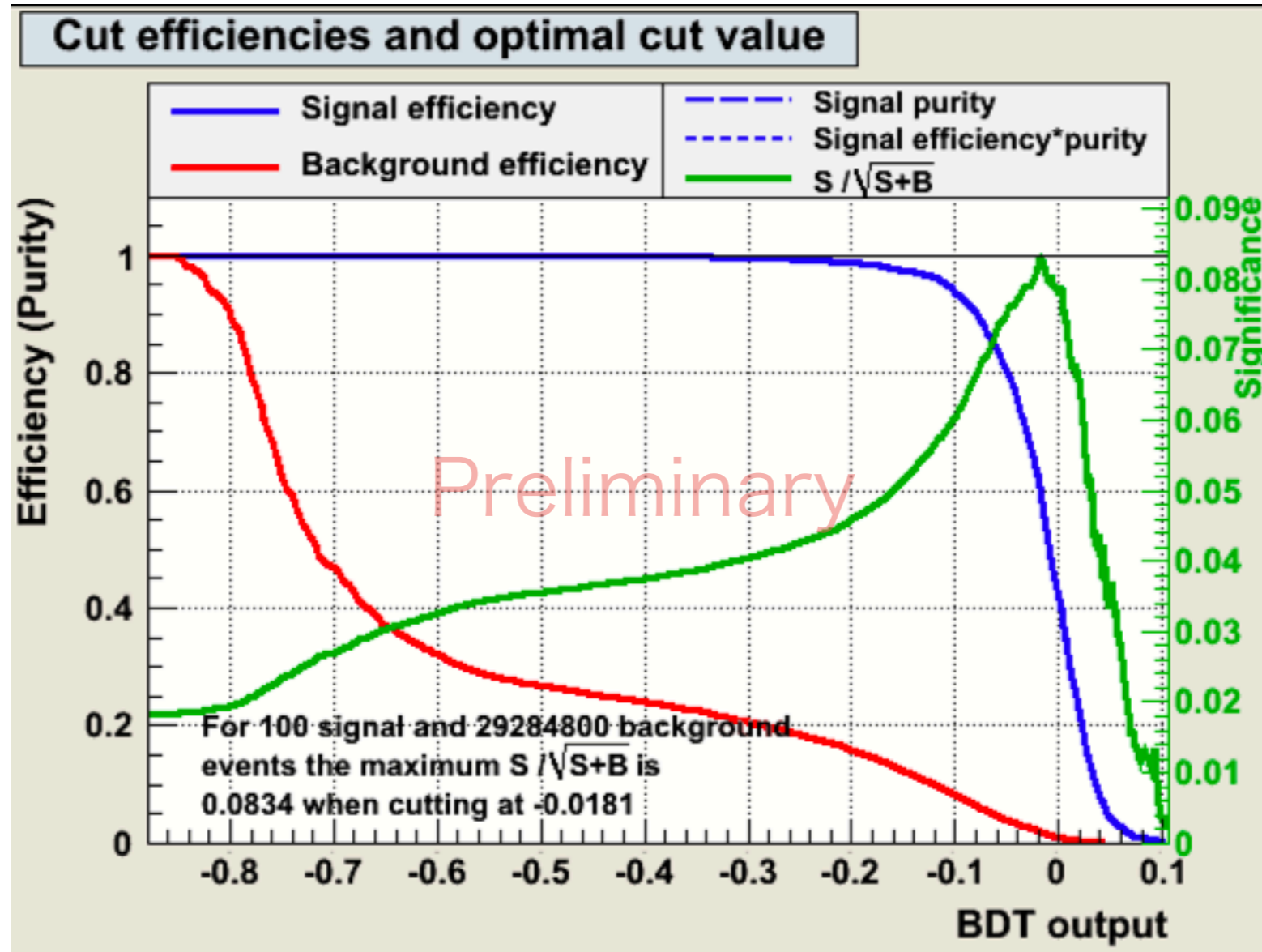
Take in  $\cos\theta_r$  in MVA



Take out  $\cos\theta_r$  from MVA

→ Check significant again

# 7. Separation by using TMVA

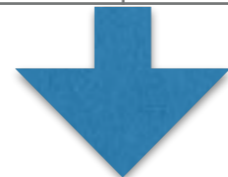


	Before cut
# of signal	99.7556
# of background	2.92848E+07

# Reduction table



	total bg	Signal	Significance
Expected	$1.4 \times 10^8$	107	0.01
Pre selection	$2.9 \times 10^7$	100	0.02
btag>0.77	$2.2 \times 10^7$	90	0.06
$E_{\text{mis}} < 35$	$1.9 \times 10^6$	82	0.06
<b>mvabdt &gt; 0.0126</b>	8996	34	<b>0.36</b>



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$E_{\text{mis}} < 35$	$1.9 \times 10^6$	82	0.06
<b>mvabdt &gt; -0.0818</b>	28664	56	<b>0.33</b>

Preliminary