

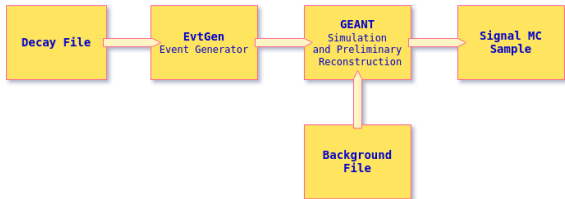
Updates on the $B^\pm \rightarrow K^\pm \tau^\pm \ell^\mp$

Inclusion of $\tau \rightarrow \rho \nu_\tau$ mode

Dr Devender Kumar

IFJ PAN, Cracow

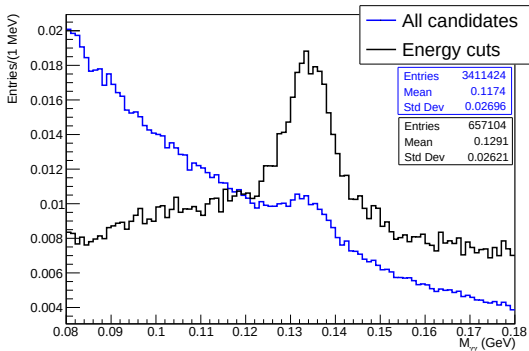
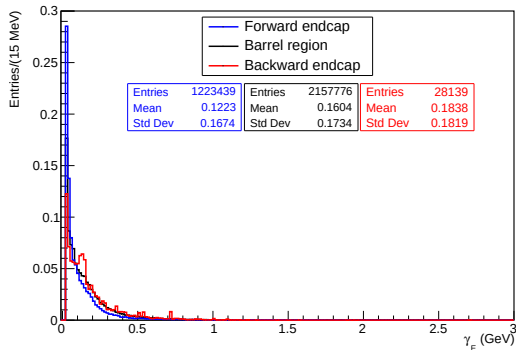
MC simulated signal event sample



Decay table	
Decay mode	Decay model
$\Upsilon(4S) \rightarrow B^+ B^-$	VSS
$B^+ \rightarrow K^+ \tau^\pm \ell^\mp$	PHSP
$\tau^+ \rightarrow \rho^+ \bar{\nu}_\tau$	TAUVECTORNNU
$\rho^+ \rightarrow \pi^+ \pi^0$	VSS
$\pi^0 \rightarrow \gamma\gamma$	PHSP

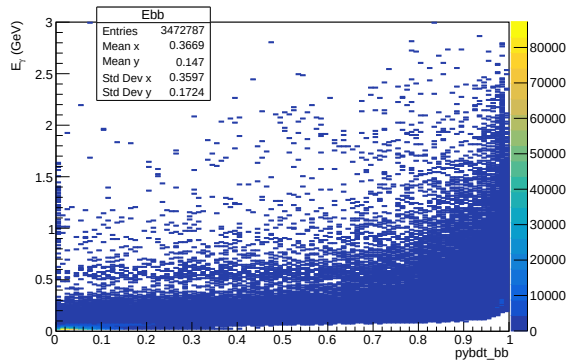
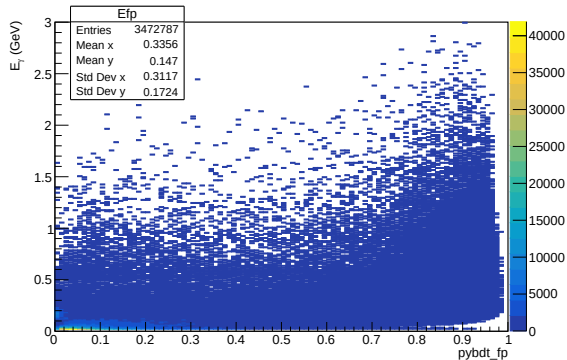
- Of the generated one million signal events, only 999375 are stored in the mini data storage tapes (mdst)s.
- Remaining events are discarded by L4 trigger.

π^0 selection



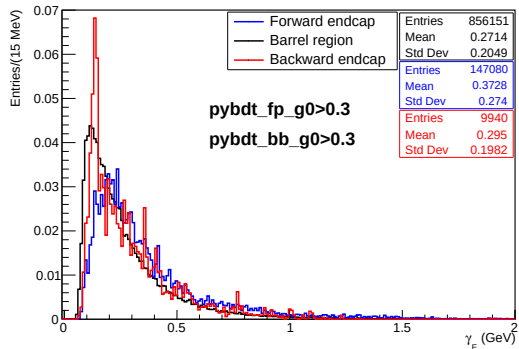
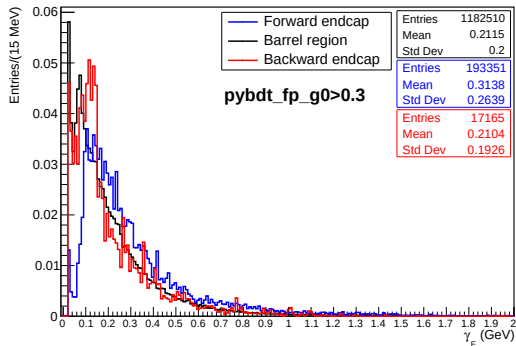
- Only the clusters in region of endcaps and barrel are accepted.
- Photon energy: Endcaps > 100 MeV and Barrel Region > 50 MeV.

Cleaning the photons



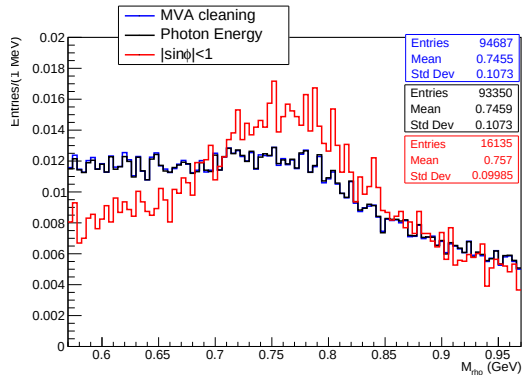
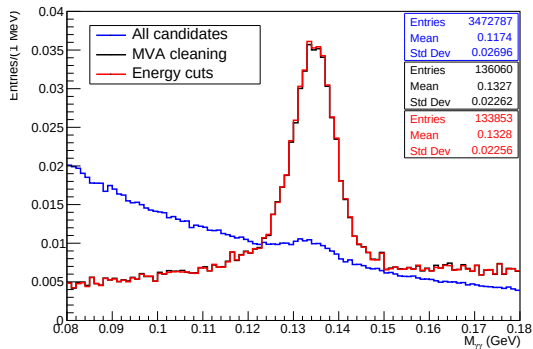
- Training variables: clusterE, clusterHighestE, clusterNhits, clusterTheta, clusterLAT, clusterE9E25, and minC2TDist.

E_γ distributions post cleaning



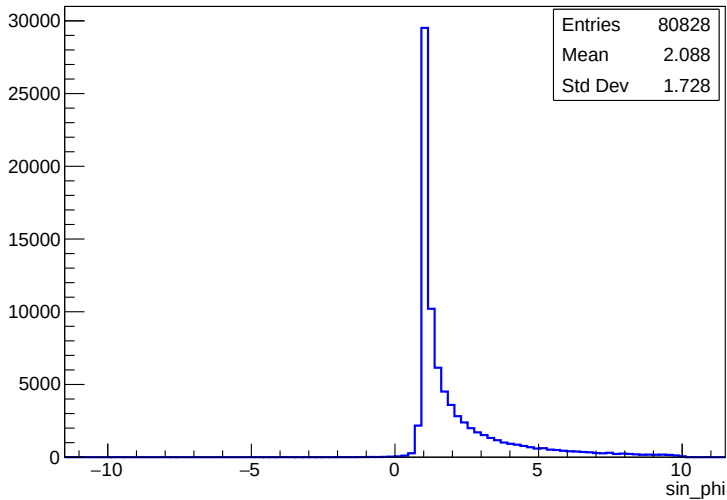
- Applying the energy condition on the first photon reconstructing a π^0 rejects 0.5% of the selected candidates.

$M_{\gamma\gamma}$ & $M_{\pi^+\pi^0}$ distributions



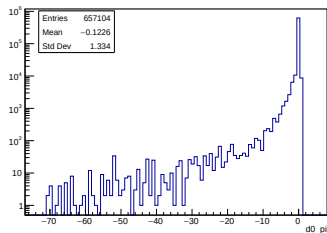
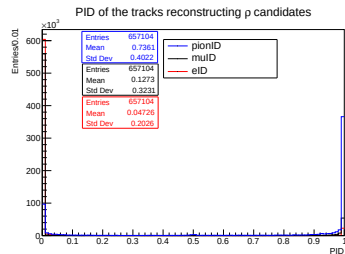
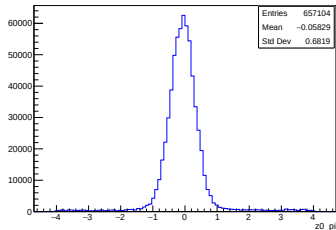
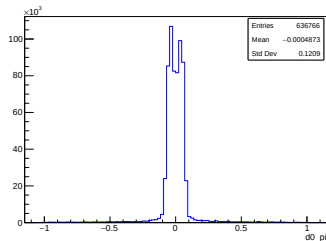
- Distances of the point of closest approach with respect to origin: $|d_0| < 1$ cm and $|z_0| < 4$ cm
- PID conditions: $eID < 0.98$, $\mu ID < 0.98$, and $\pi ID > 0.4$.

$\sin \phi$ distribution



Back Up

charged π selection



- Distances of the point of closest approach with respect to origin: $|d_0| < 1$ cm and $|z_0| < 4$ cm
- PID conditions: $eID < 0.98$, $muID < 0.98$, and $pionID > 0.4$.

Junaid's conditon