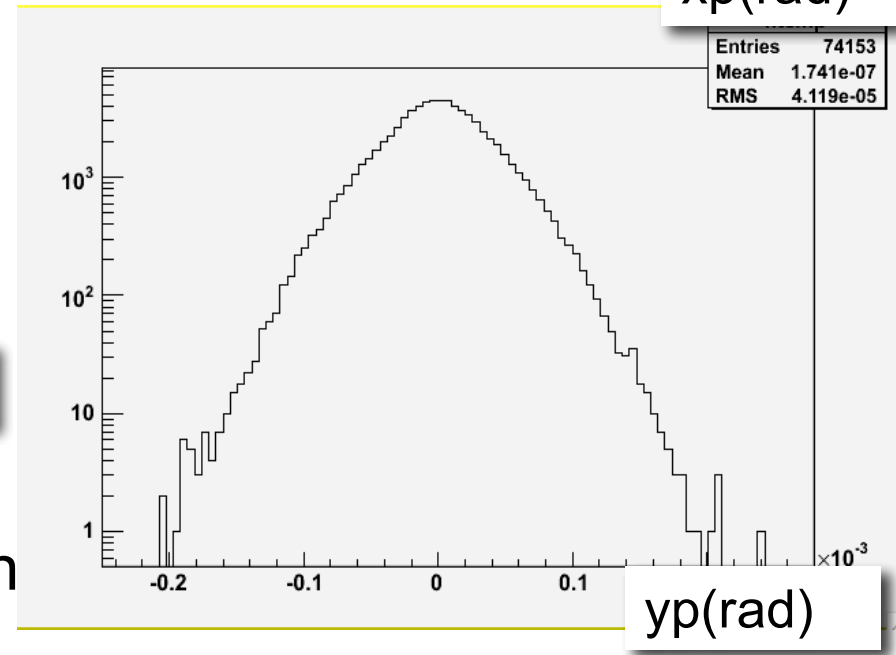
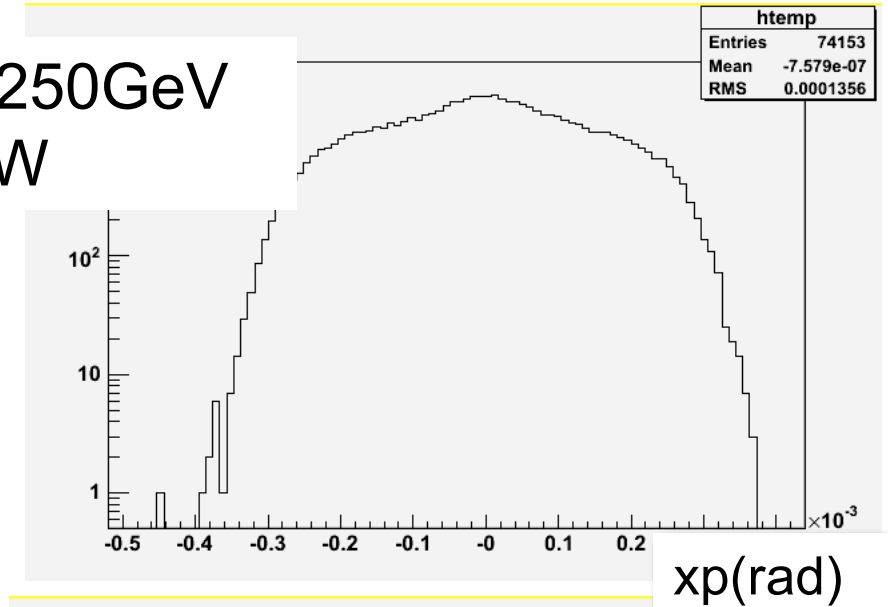
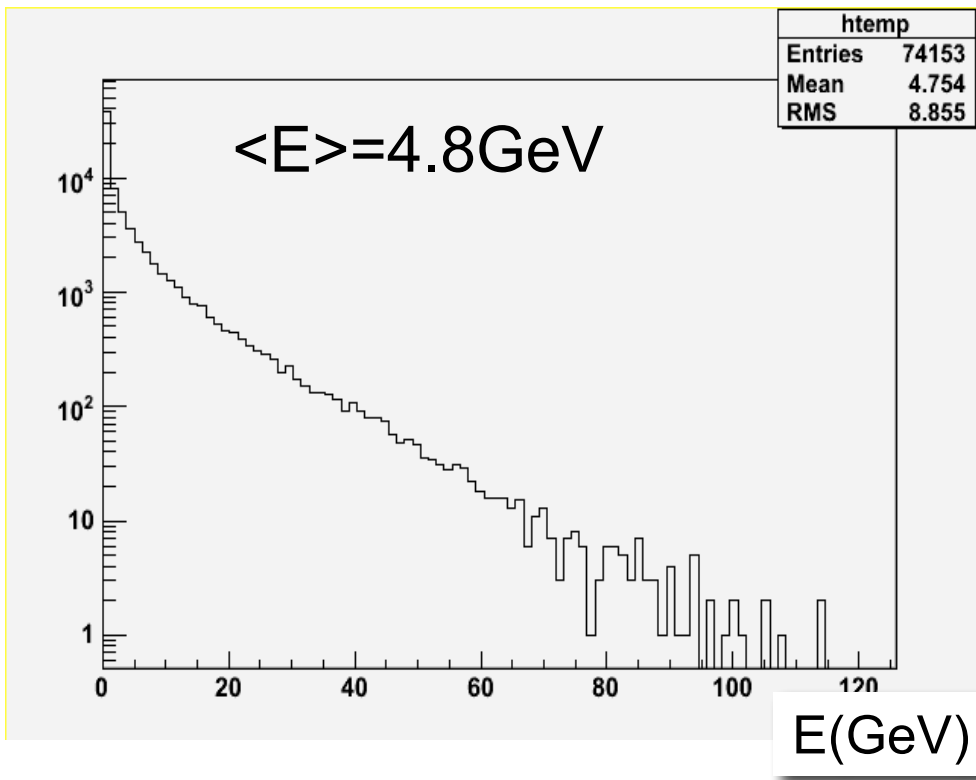


Evaluation of Backscattered photons from beamstrahlung loss at the intermediate dump in HeadOn extraction line

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Beamstrahlung photon

Nominal beam parameters set @ 250GeV
Total beamstrahlung power~293kW



Results from GuineaPig++ version

Intermediate water dump @ 140m

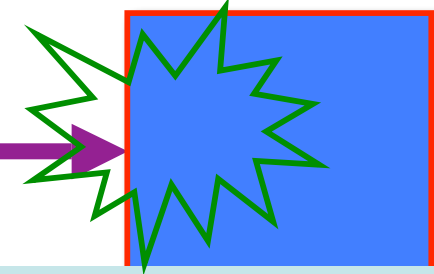
beamstrahlung

$(E, x_p, y_p, 0, 0, 0)$

IP

140m drift space

Secondary photons



4m water dump
with few mm of
Aluminum around

I supposed that all the 293kW is deposited on the water dump
The simulation was done using BDSIM simulation
(Geant4 based)

Question :

How many backscattered photons can reach the IP
passing through the 2cm radius beam cal ?

Backscattered photons

~87% of backscattered photons

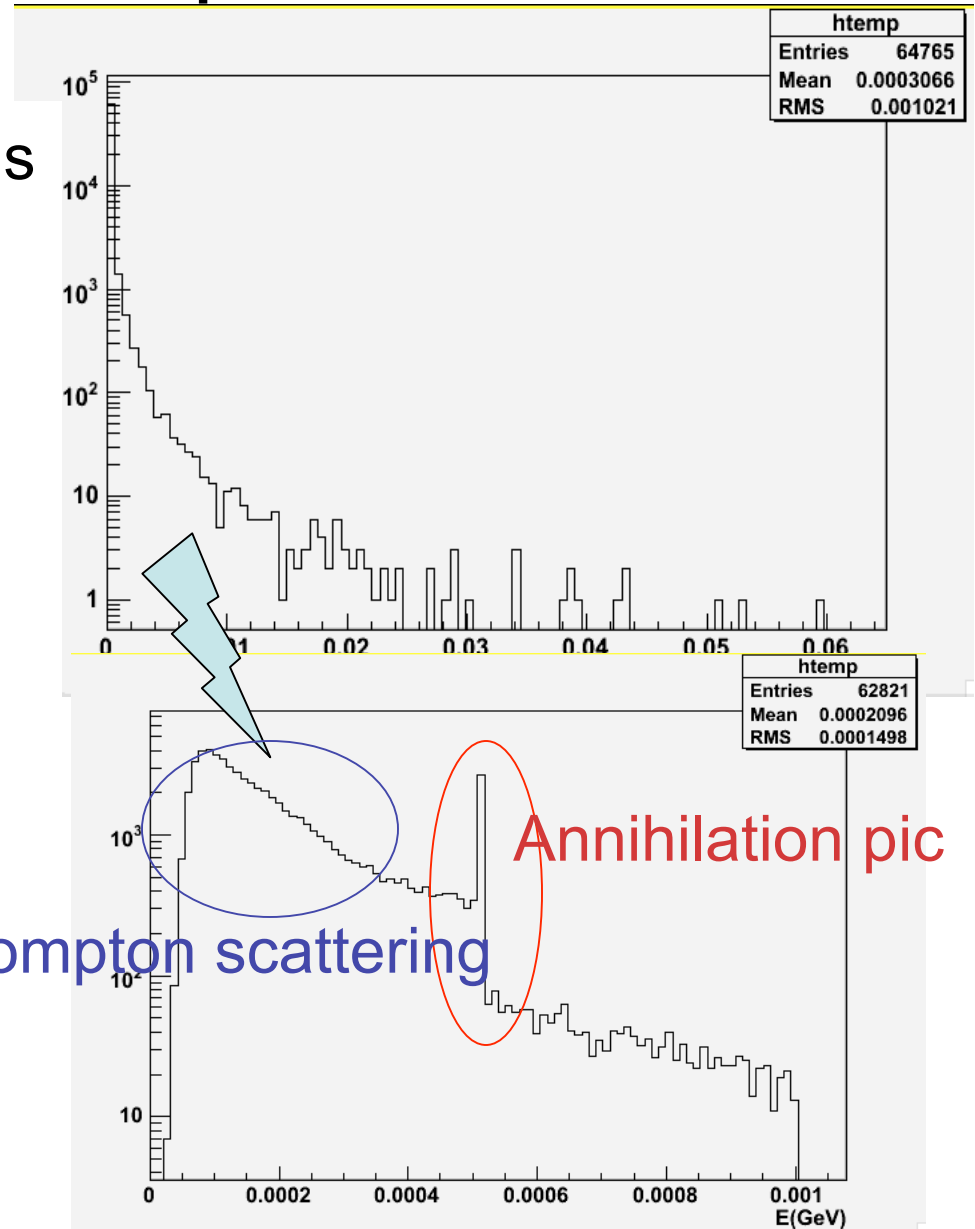
$\langle E \rangle \sim 30 \text{ MeV}$

In the solid angle defined
by the 2cm beam cal radius
and 140m

– Not enough static to
conclude

But if we study the $\cos\theta$ we
don't have such problem
see Takashi Maruyama's talk

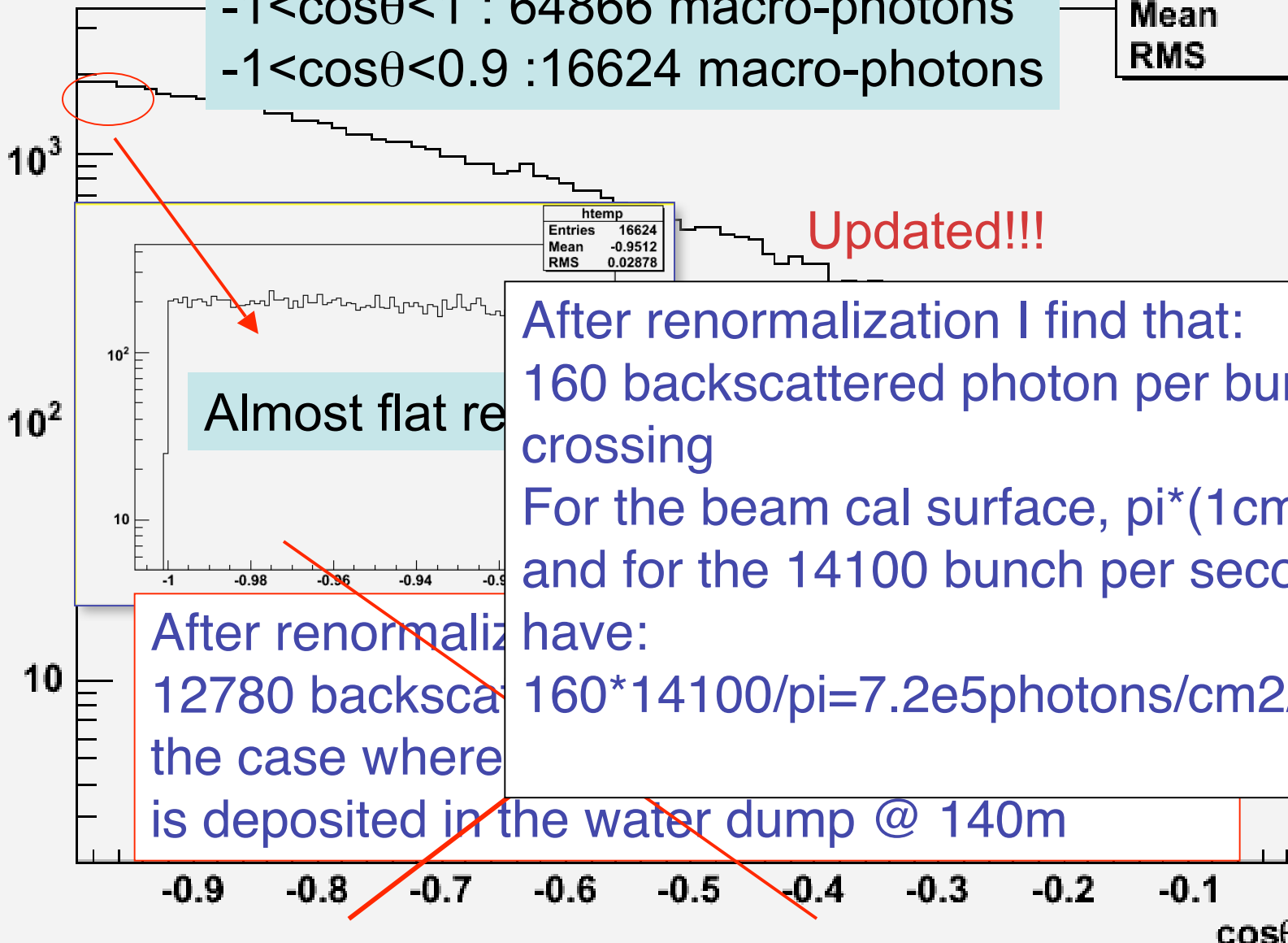
Synchrotron radiation from 2mrad FD and
backscattering from extraction line elements



cosθ distribution

htemp	
Entries	64866
Mean	-0.7299
RMS	0.2055

-1 < cosθ < 1 : 64866 macro-photons
 -1 < cosθ < 0.9 : 16624 macro-photons



htemp	
Entries	16624
Mean	-0.9512
RMS	0.02878

Updated!!!

Almost flat re

After renormaliz have:
 12780 backsca
 the case where
 is deposited in the water dump @ 140m

After renormalization I find that:
 160 backscattered photon per bunch crossing
 For the beam cal surface, $\pi \cdot (1\text{cm})^2$,
 and for the 14100 bunch per second I
 have:
 $160 \cdot 14100 / \pi = 7.2e5 \text{ photons/cm}^2/\text{s}$

Number of backscattered photons

From Lew's results:

@140 we have 165kW beamstrahlung losses
it mean that:

4.05e5photons/cm2/s

Must study the behavior of those photons in the
detector using specifics tools
(Mokka and Marlin)