



Impinging angle distribution on QW

Girdish Laishram, **Rohit Jangid**, Tanya Tanvi
C. Chatterjee, R. Kumar, D. Samuel, M. Thakur

dRICH Simulation Meeting

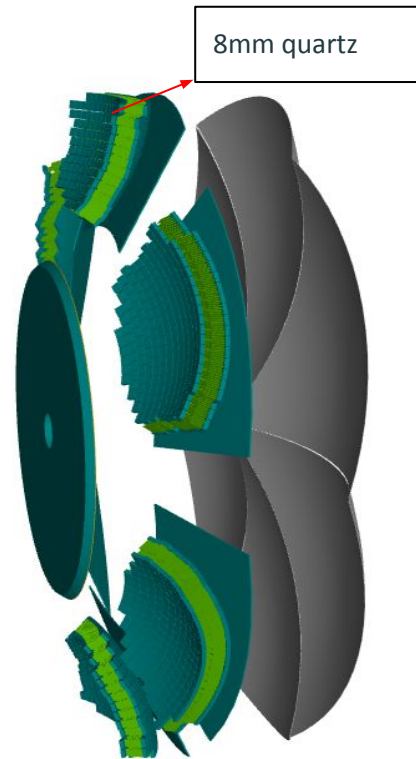
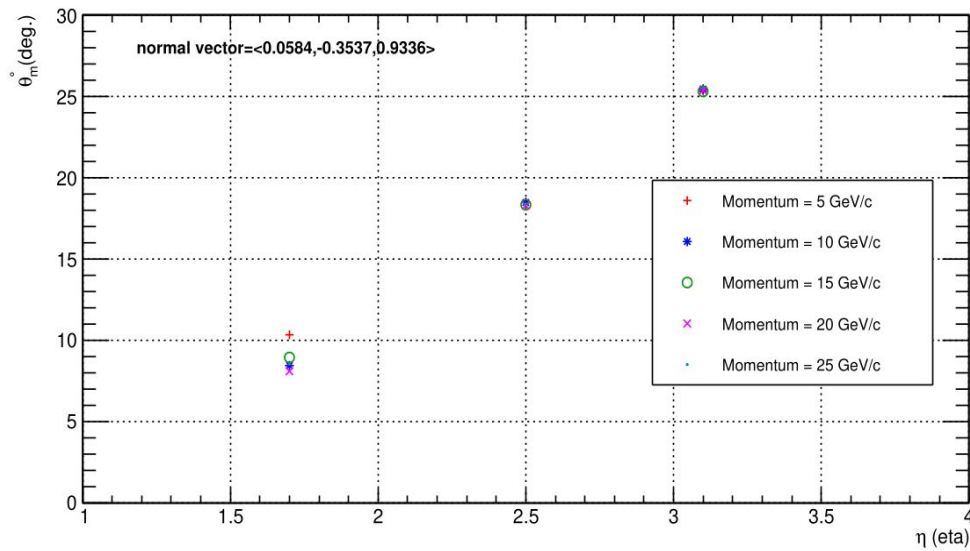
13/11/25

QW geometry

Previous work

- QW implementation was done
- Impinging angle grows with eta

Impinging angle evolution in eta at fixed phi



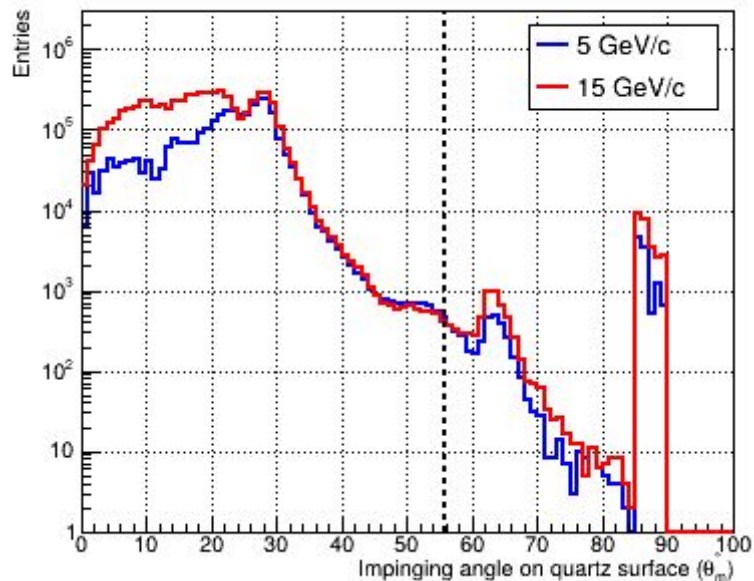
dRICH with QW

Impinging angle Dist.

Data set : whole eta range (1.5 - 3.5) and phi (0 - 2π),
particle : pion+ [PDG: 211],
momentum (GeV/c) value: {5, 7.5, 10, 12.5, 15}
Total of $\sim 100 \times 5$ K events.

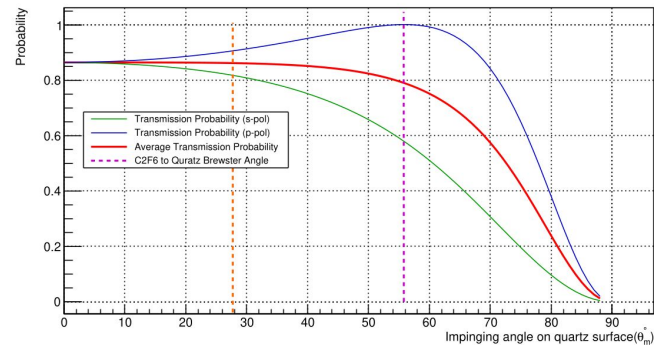
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Sector 0: Impinging Angle on Quartz Surface



- Distribution of impinging angle is similar for all the sectors.
- 99 % photons lies below brewster angle.

Transmission probability



```
1 Brewster angle value (degrees): 55.80
2 Sector-wise MC photon count
3 -----
4 Sector Total count below cut  above cut  % below  % above
5 -----
6 0  3016724  2997266  19458  99.35  0.65
7 1  2967845  2944477  23368  99.21  0.79
8 2  3043355  3020136  23219  99.24  0.76
9 3  3016589  2998517  18072  99.40  0.60
10 4  2996113  2976957  19156  99.36  0.64
11 5  3186878  3164373  22505  99.29  0.71
```

Plots are integrated in all over space.

Brewster stat

Summery:

- Impinging angle distribution is symmetric in azimuth and grows with η .
- Impinging angle distribution is symmetric for different momentum values as well.
- 99 % of MC photons lies below brewster angle showing high transmission probability through QW.

THANK YOU

Looking forward to feedback & comments

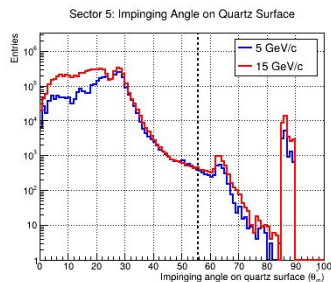
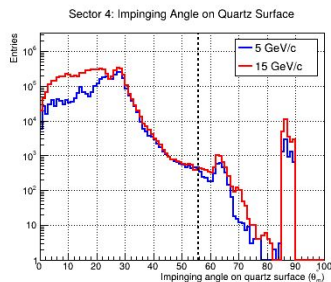
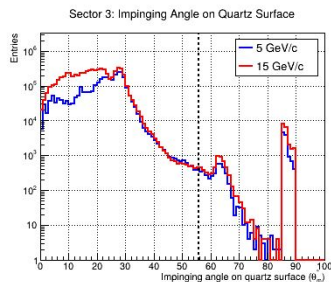
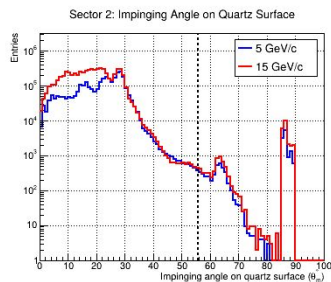
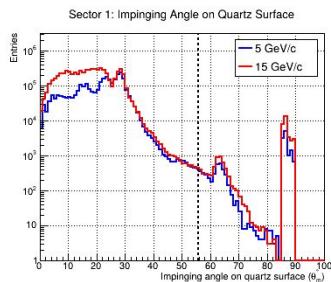
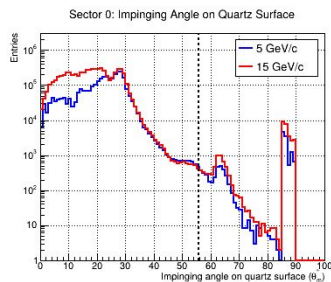
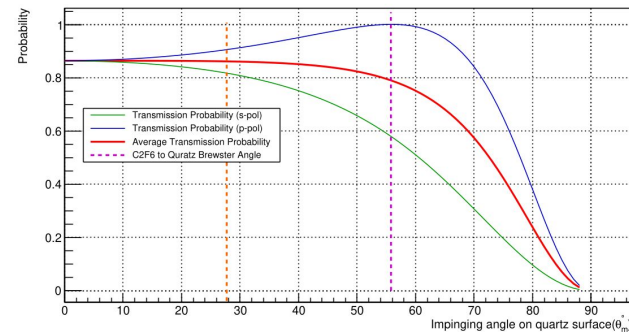
Backup

Impinging angle Dist.

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Transmission probability



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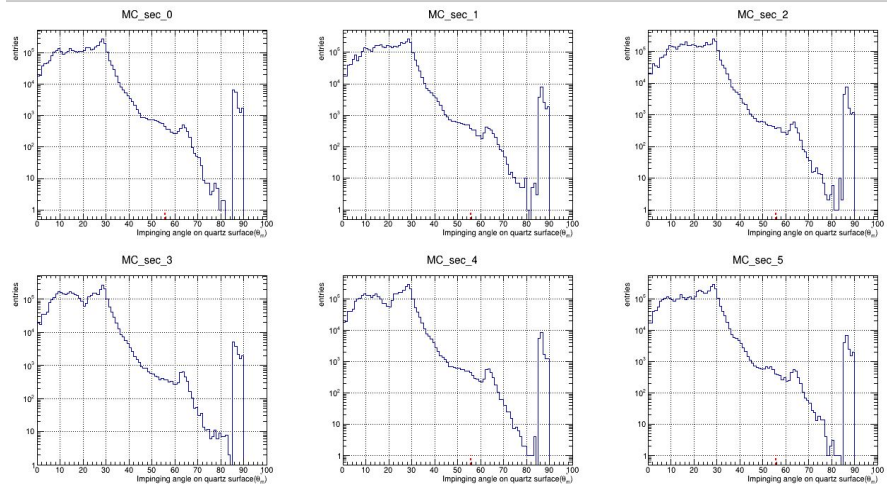
2 Sector-wise MC photon count

3	-----				
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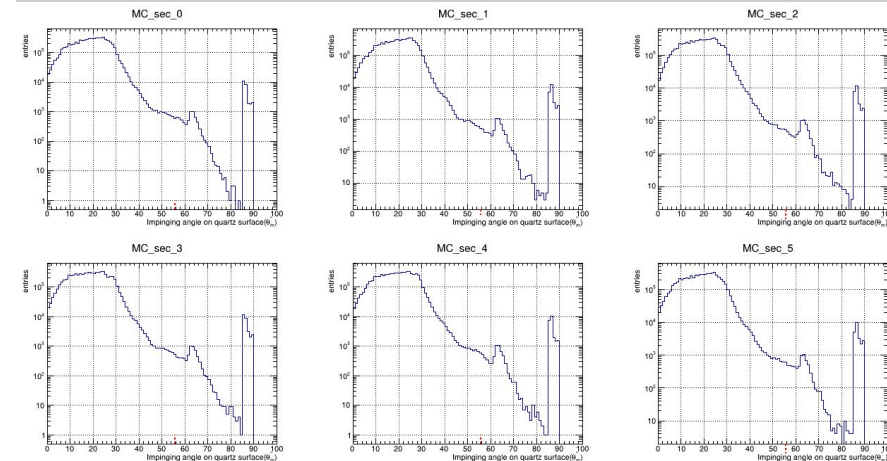
Plots are integrated in all over space.

Brewster stat

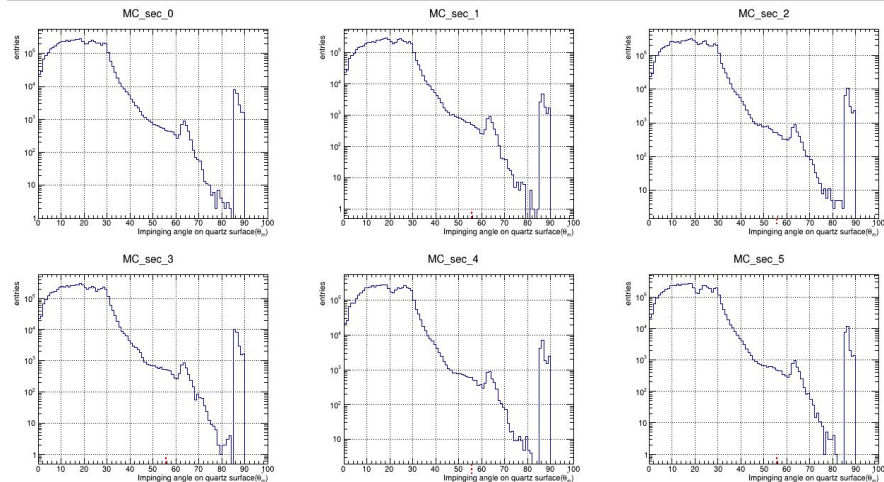
Impinging angle distribution, at 7.5 GeV/c.



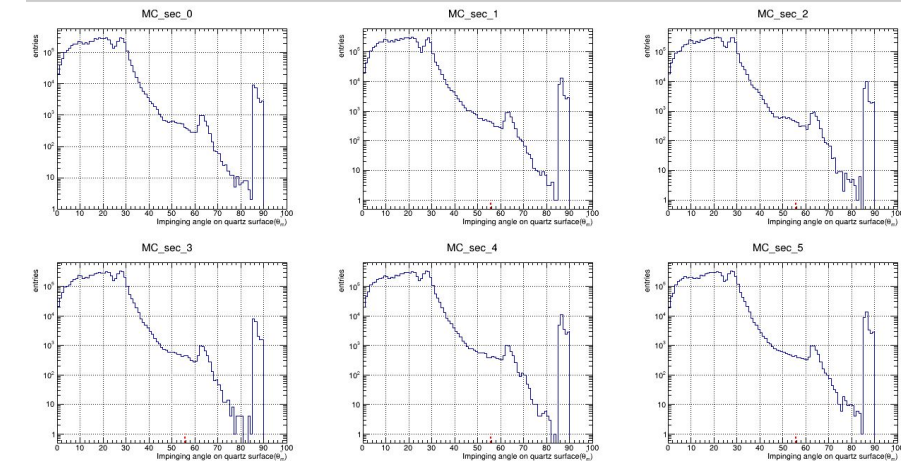
Impinging angle distribution, at 12.5 GeV/c.



Impinging angle distribution, at 10 GeV/c.

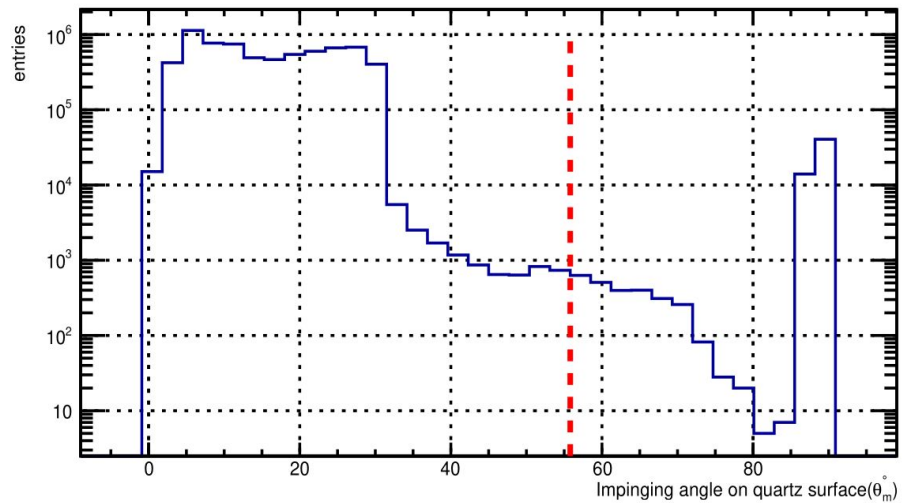


Impinging angle distribution, at 15 GeV/c.



$\Phi = \pi/2$, all eta [1.5-3.5]

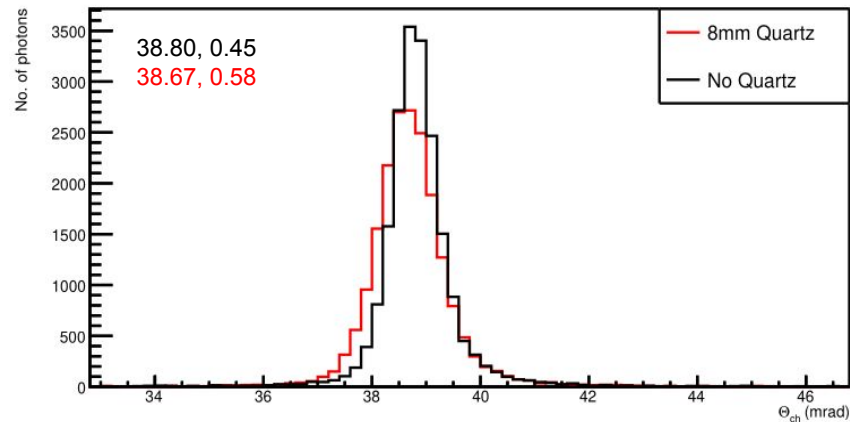
MC_thetai_cc_hist



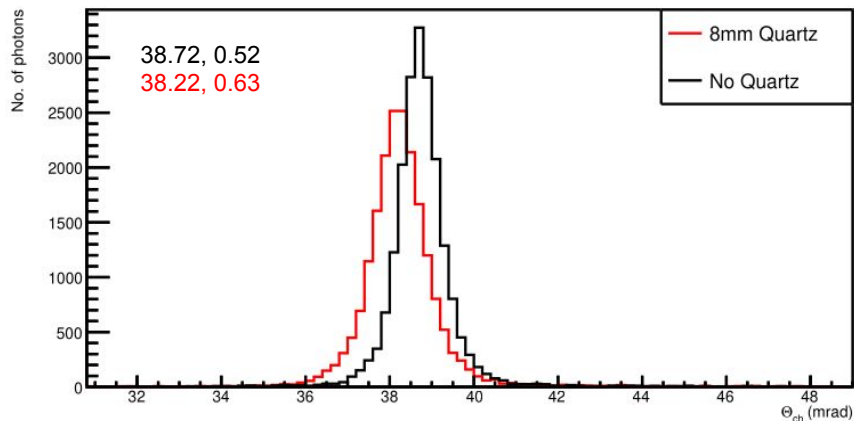
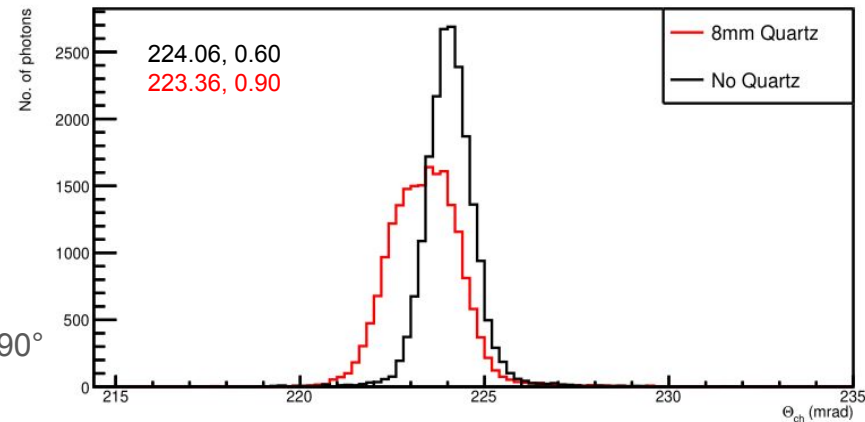
Cherenkov angle :

1. ~ 0.5 mrad. Shift in cherenkov angle

Plots are integrated all over pseudorapidity



Azimuth 90°



Azimuth 60°

