

First look of pfRICH with aerogel
 $n = 1.04$, sapphire window and shortened
proximity gap.

Changes compared to march review

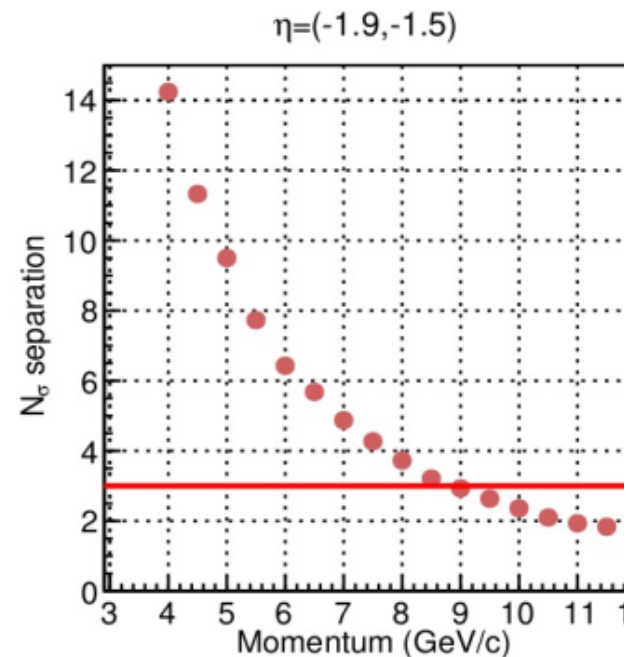
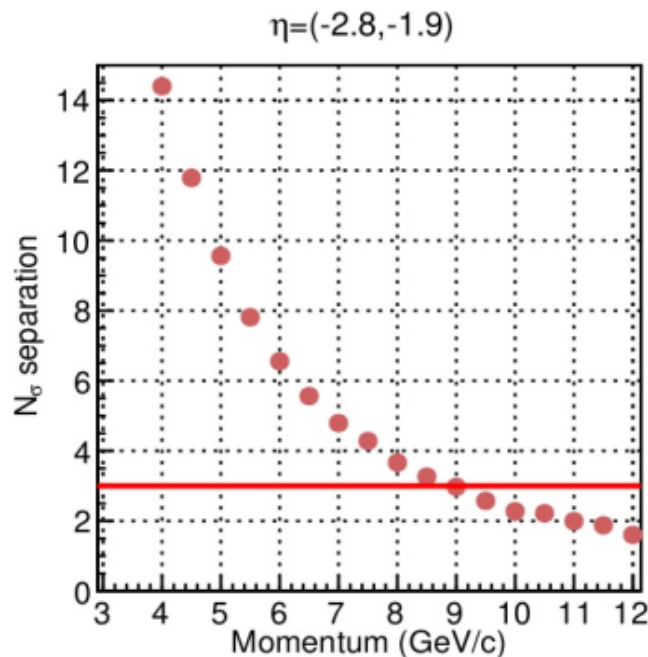
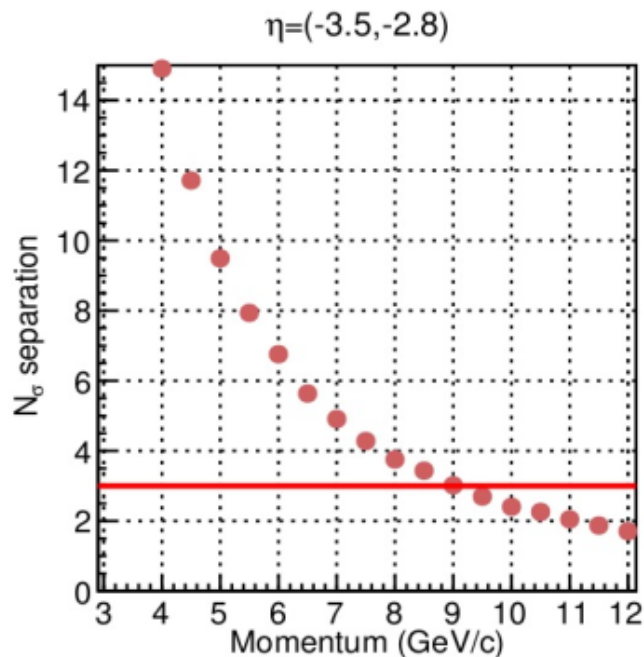
- Proximity gap has been shortened. 54 cm → 49 cm
 - New aerogel type is used. 1.045 → 1.04
 - Sapphire window is added. (Effects has not yet been studied)
-
- Comparisons have been made w/ and w/o the pyramidal mirror.

Changes compared to march review

- Proximity gap has been shortened. 54 cm → 49 cm
 - We expect worsen resolution for Single Photo electron
- New aerogel type is used. 1.045 → 1.04
 - We expect saturation angles are lowered by ~20 mrad
- Sapphire window is added. (Effects has not yet been studied)

- Comparisons have been made w/ and w/o the pyramidal mirror.

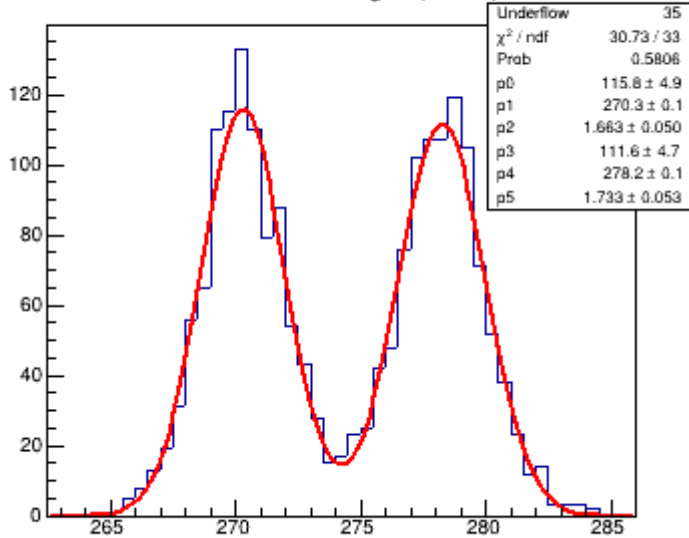
Performance comparisons



At 7 GeV/c we had had very close to 5 sigma separation w/o pyramidal mirror

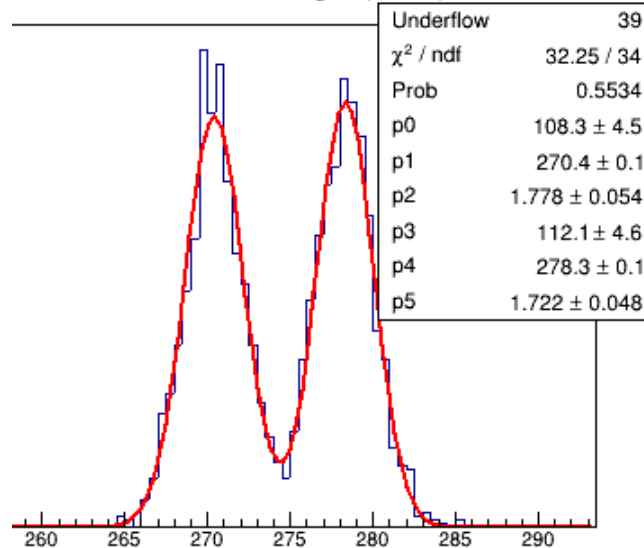
Performance comparisons (almost)

Cherenkov angle (track)



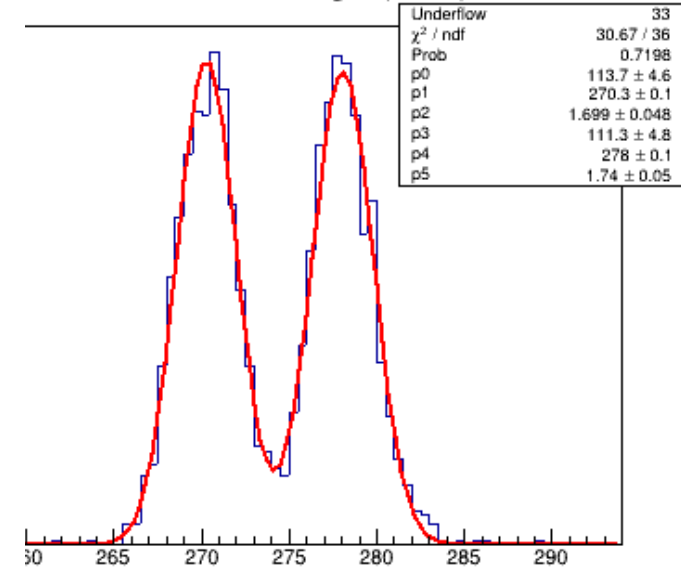
At eta -2.0 4.7 sigma

Cherenkov angle (track)



At eta -2.5 4.5 sigma

Cherenkov angle (track)

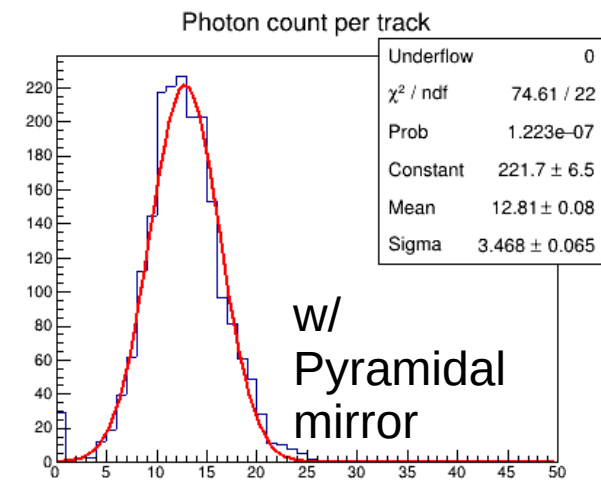
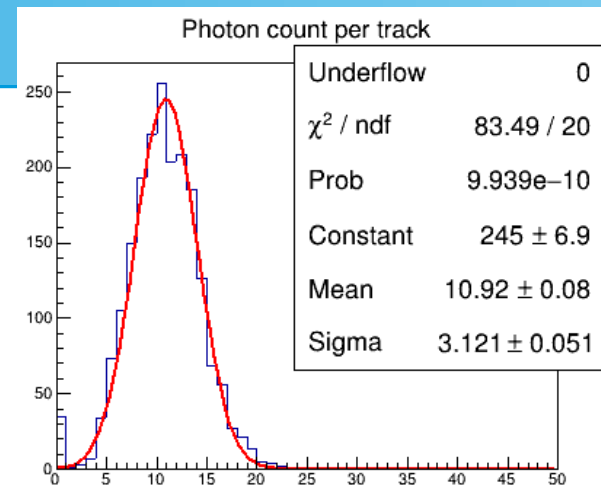


At eta -2.0 4.5 sigma

w/o Pyramidal mirror

Performance comparisons (almost)

w/o Pyramidal mirror



Cherenkov angle (track)

Underflow	35
χ^2 / ndf	30.73 / 33
Prob	0.5806
p0	115.8 \pm 4.9
p1	270.3 \pm 0.1
p2	1.663 \pm 0.050
p3	111.6 \pm 4.7
p4	278.2 \pm 0.1
p5	1.733 \pm 0.053

Cherenkov angle (track)

Underflow	29
χ^2 / ndf	38.52 / 35
Prob	0.3134
p0	124.7 \pm 5.2
p1	270.4 \pm 0.1
p2	1.53 \pm 0.04
p3	129.8 \pm 5.5
p4	278.2 \pm 0.1
p5	1.5 \pm 0.0

At eta -2.0 4.7 sigma

w/o Pyramidal mirror

At eta -2.0 5 sigma

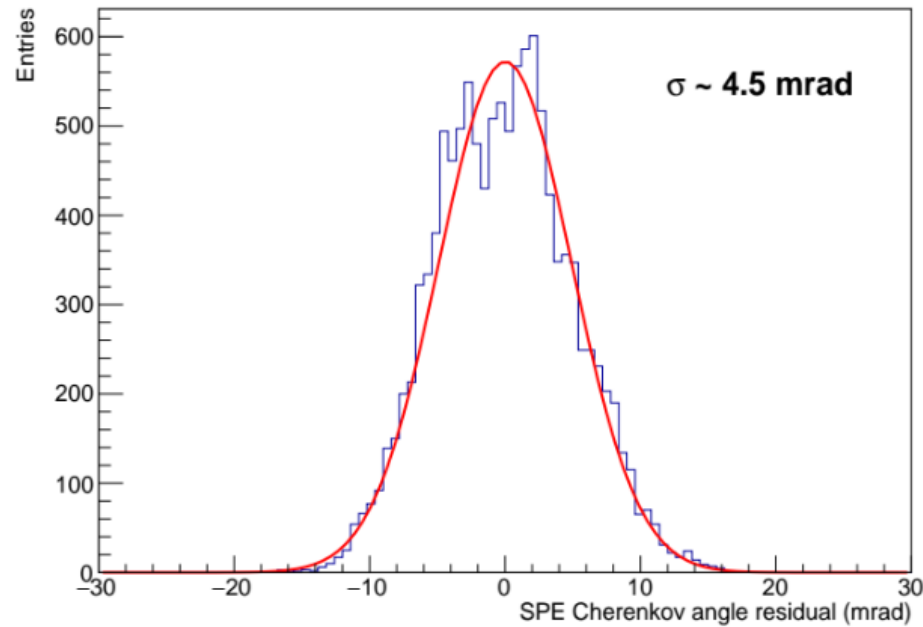
w/ Pyramidal mirror

Single photon resolution

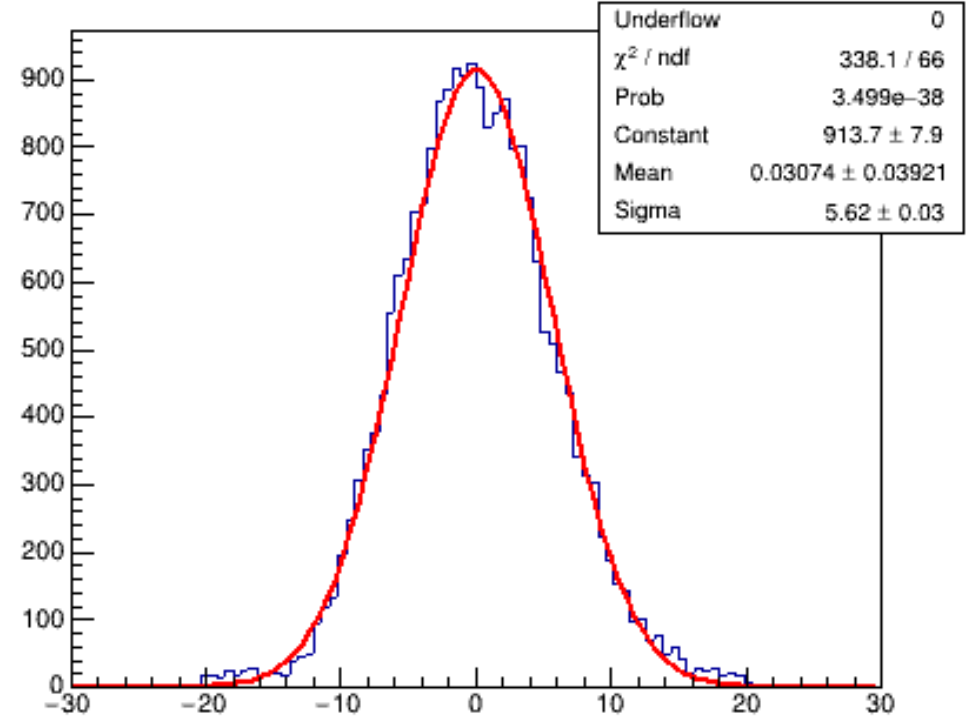
Cherenkov angle (SPE)
resolution ~ 4.5 mrad

$\eta:-2.0$

Cherenkov angle (SPE)



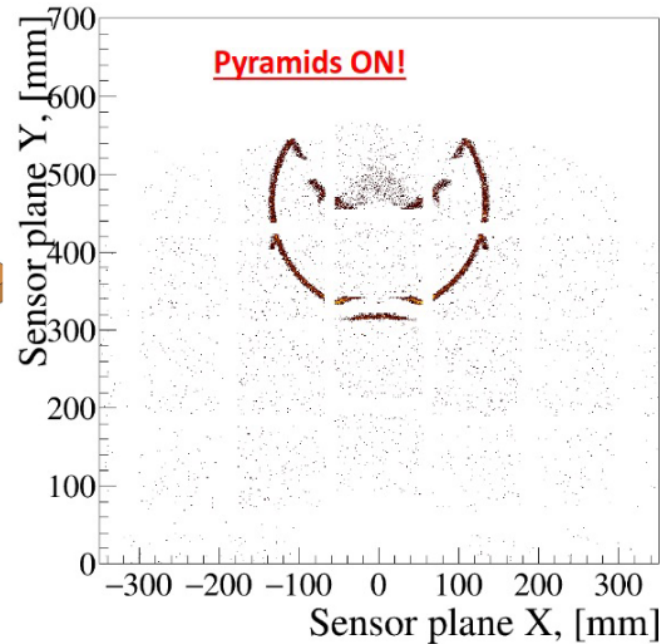
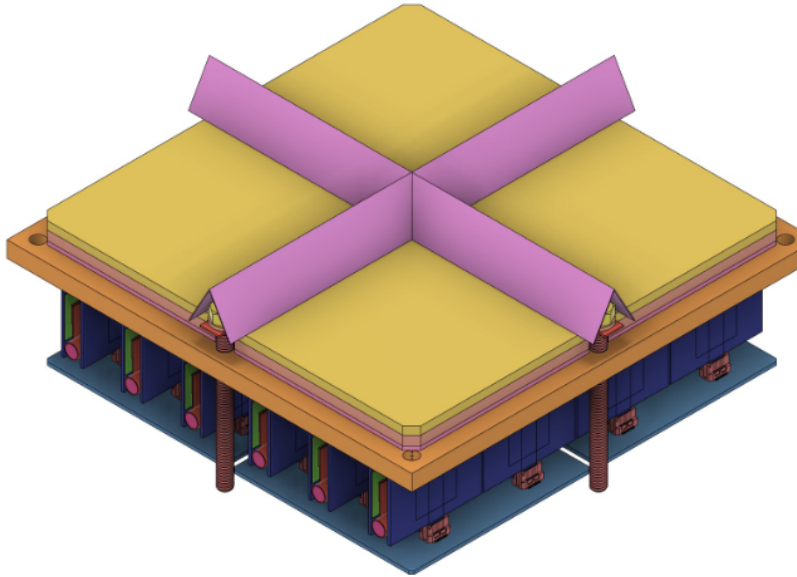
Cherenkov angle (SPE)



Now resolution has worsen by a mrad

Studies that can be 'quickly' done

- The pyramidal mirror can be beneficial.



We need to validate and optimize its geometry.

To check deliverable performance at 7 GeV/c w/ tuned and w/o the pyramidal mirror.