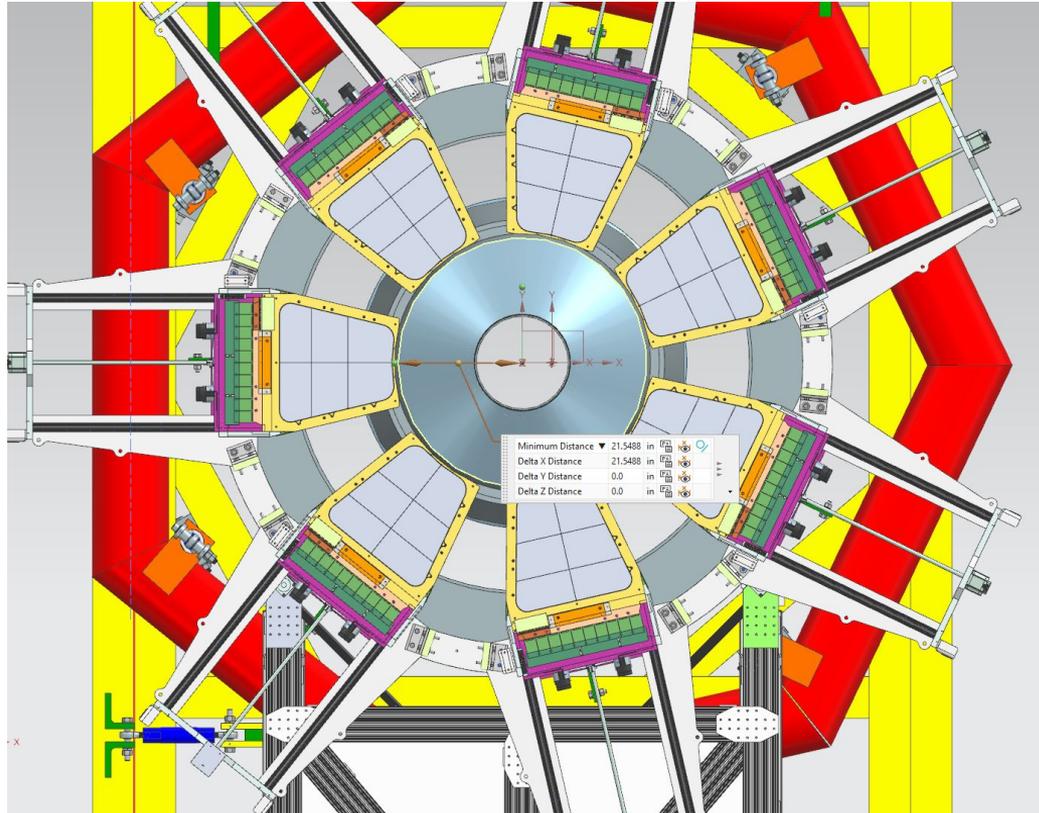


# GEM R positions

James Shirk

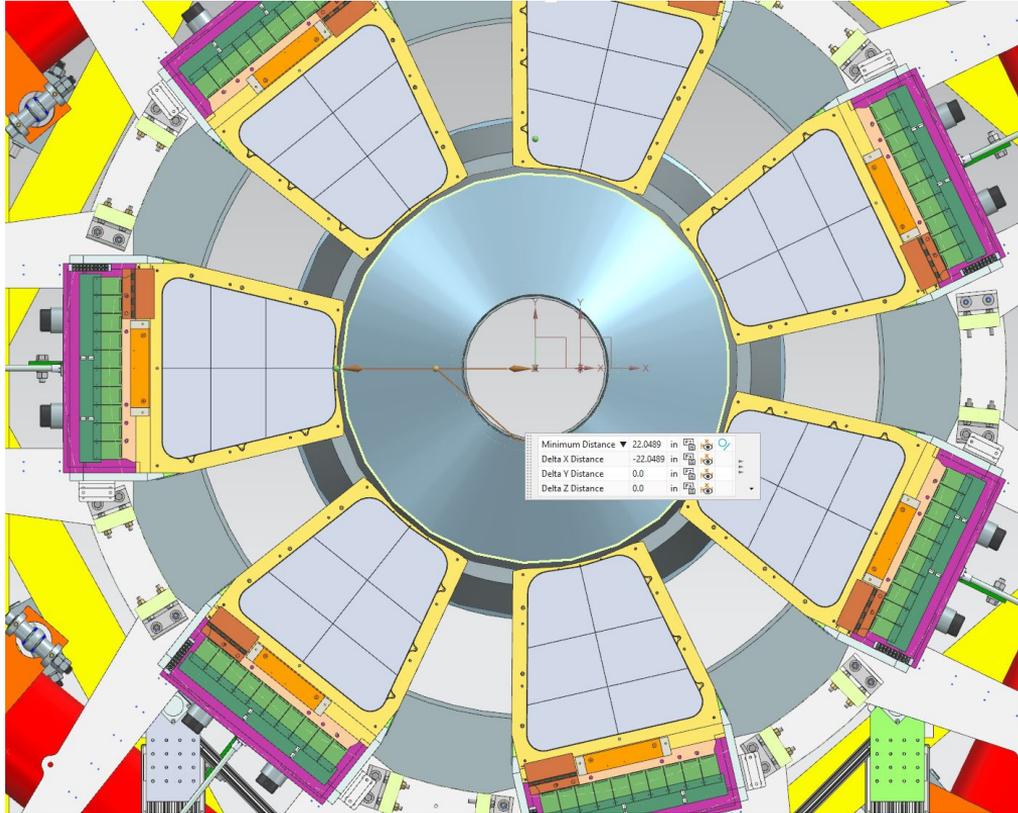
We can control the r position of the GEMs (to a point)



Plane 1/2 minimum r is:

547.3 mm

We can control the r position of the GEMs (to a point)

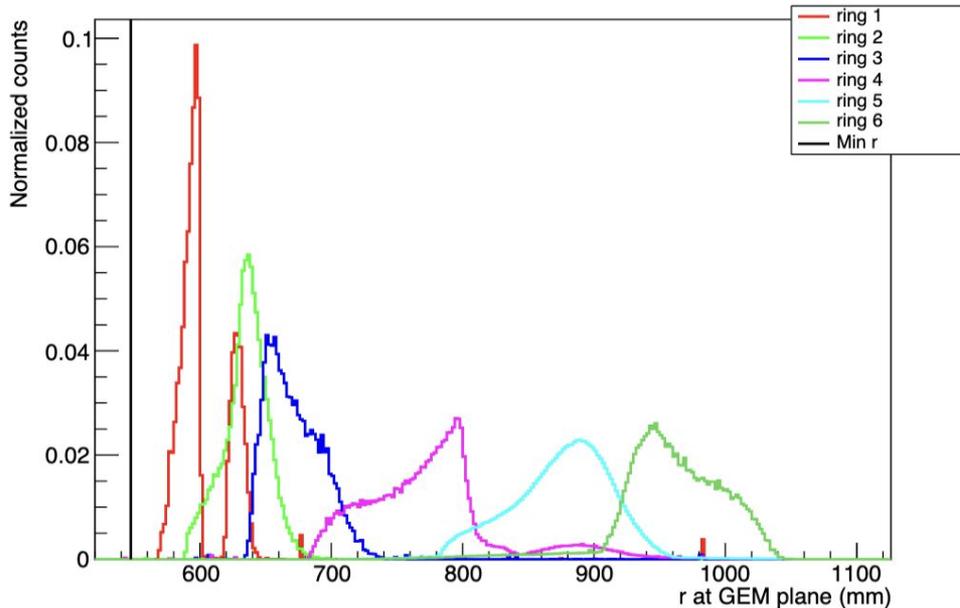


Plane 3/4 minimum r is:

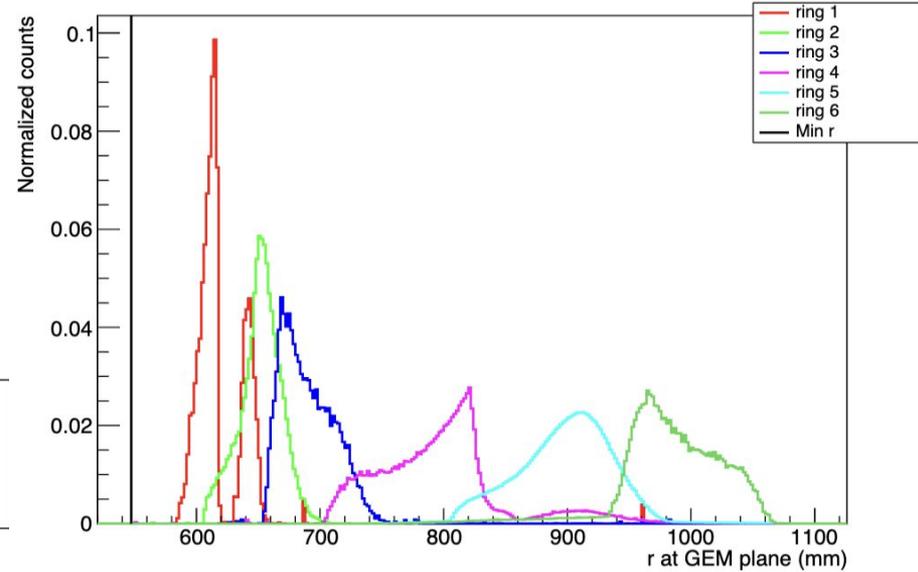
560.0 mm

# Projection from main detector tiles to GEM planes 0 and 1

Rings Projected to GEM plane 0



Rings Projected to GEM plane 1

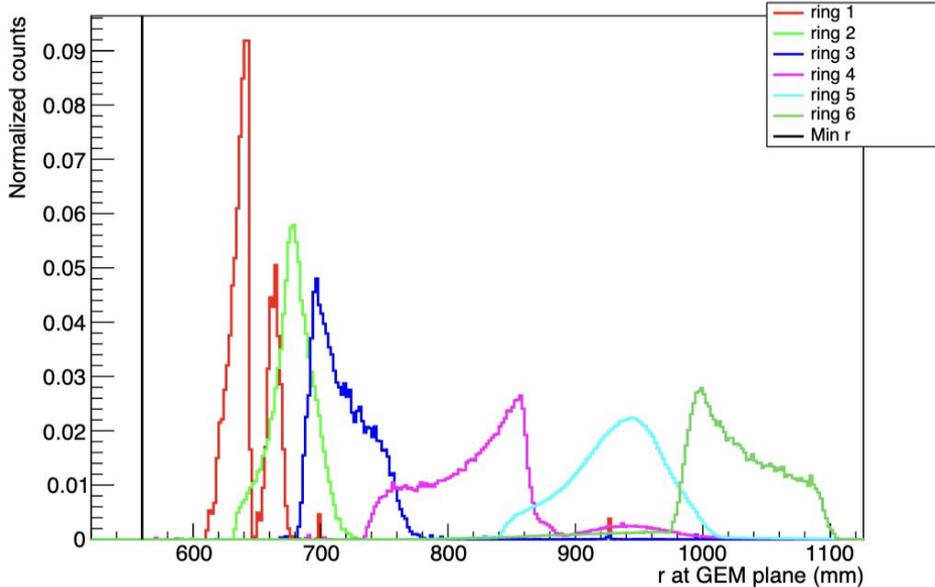


X axis is the r of the hit at the GEM plane given the hit later goes and hits the main detector tile

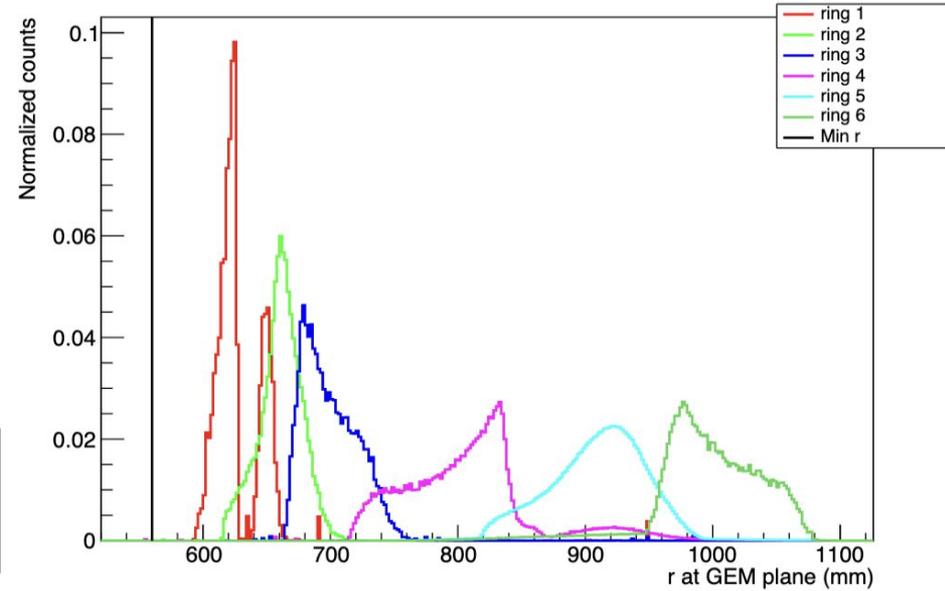
Only primary events on the GEM plane and main detector tiles are counted

# Projection from main detector tiles to GEM planes 2 and 3

Rings Projected to GEM plane 3



Rings Projected to GEM plane 2



X axis is the  $r$  of the hit at the GEM plane given the hit later goes and hits the main detector tile

Only primary events on the GEM plane and main detector tiles are counted

# Biggest constraints on each r position

- Nearly impossible to simultaneously capture all of ring 1 and ring 6
- Decided to choose r to minimize counts lost in sums of rings 2 and 6
  - For planes 0 and 1, lower r -> 585 mm
  - For planes 2 and 3, lower r -> 616.5 mm

# Biggest constraints on each r position

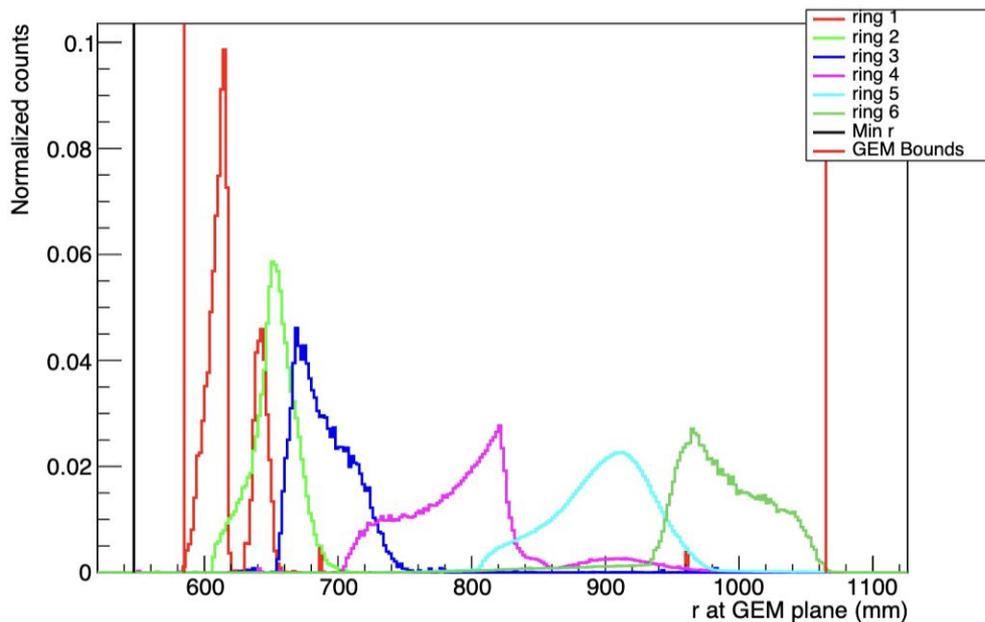
- Nearly impossible to simultaneously capture all of ring 1 and ring 6
- Decided to choose r to minimize counts lost in sums of rings 2 and 6
  - For planes 0 and 1, lower r -> 585 mm
  - For planes 2 and 3, lower r -> 616.5 mm

Ratio of counts with gem r cut / without gem r cut

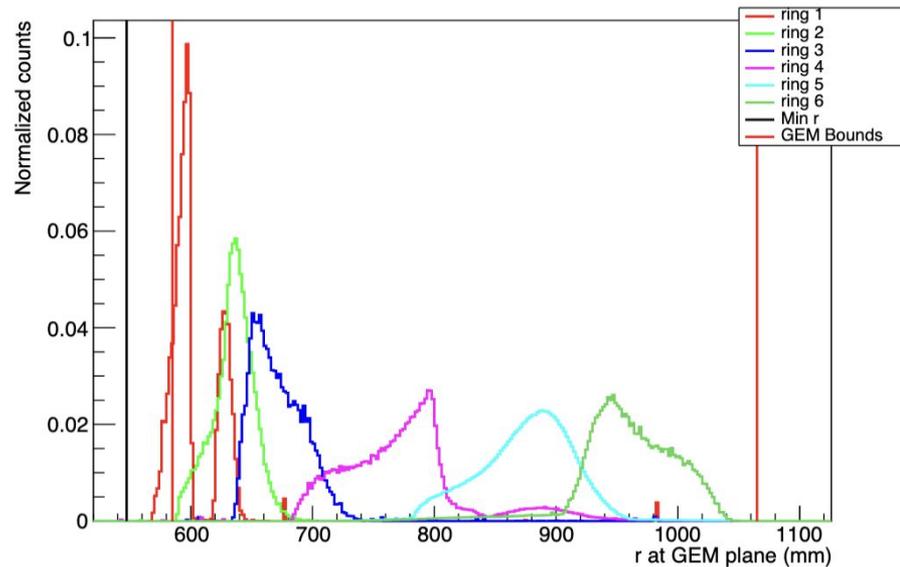
	ring 1	ring 2	ring 3	ring 4	ring 5	ring 6
pln 0	[0.9163281	0.99985734	0.99999832	0.9990571	0.9999927	0.9999909 ]
pln 1	[0.99974998	0.99987869	0.99999832	0.9988995	0.99934178	0.99915261]
pln 2	[0.84399811	0.99856927	0.99999343	0.99905603	0.99991222	0.99995515]
pln 3	[0.99218793	0.99953572	1.	0.99873895	0.99883189	0.99114451] ]

# Projection from main detector tiles to GEM planes 0 and 1 with bounding lines

## Rings Projected to GEM plane 1

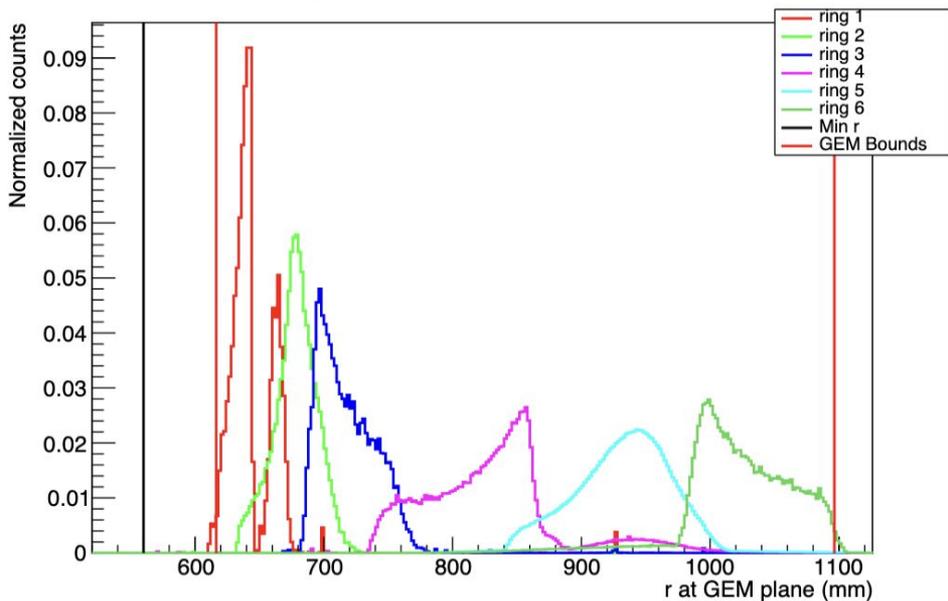


## Rings Projected to GEM plane 0

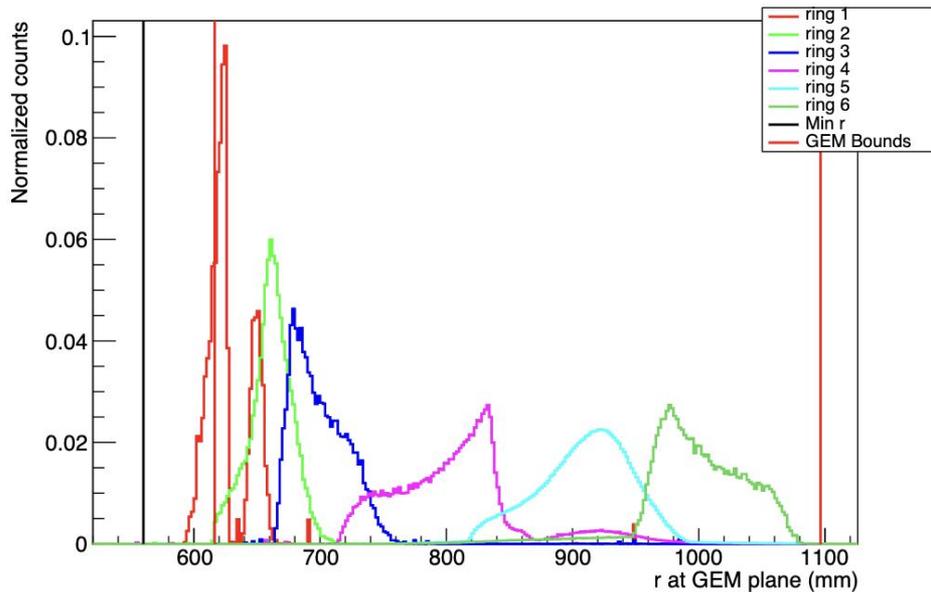


# Projection from main detector tiles to GEM planes 2 and 3

## Rings Projected to GEM plane 3



## Rings Projected to GEM plane 2



# Z locations of the front of GEM planes

```
<!-- Virtual planes in the parallel world -->  
<position name="trackingDetectorVirtualPlaneFront1_pos" z="19724.7" unit="mm"/>  
<position name="trackingDetectorVirtualPlaneFront2_pos" z="19724.7+395.3" unit="mm"/>  
<position name="trackingDetectorVirtualPlaneBack1_pos" z="19724.7 + 605.0" unit="mm"  
<position name="trackingDetectorVirtualPlaneBack2_pos" z="19724.7 + 1000.3" unit="mm"
```