Stony Brook University

Center for Frontiers in Nuclear Science

Jefferson Lab

The suggested modification for R1 Quartz tiles

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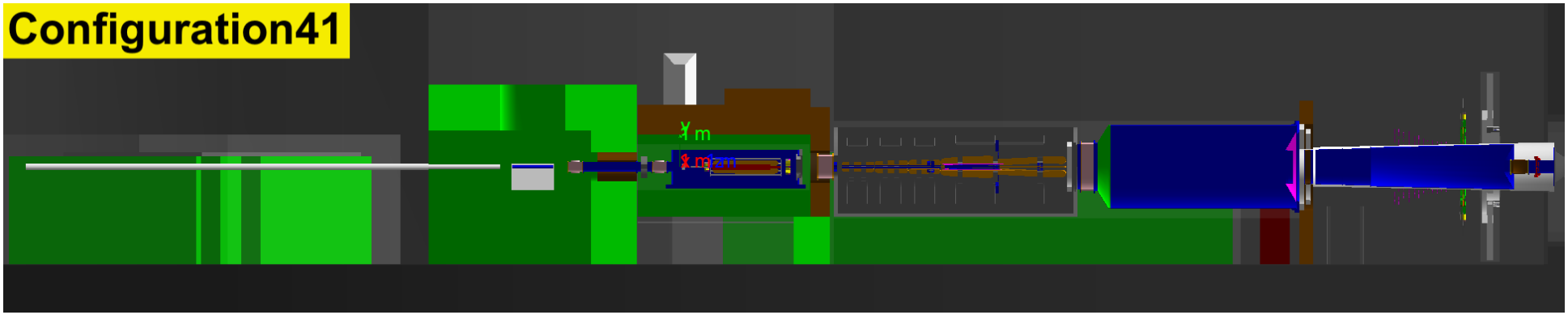
Simulation geometry

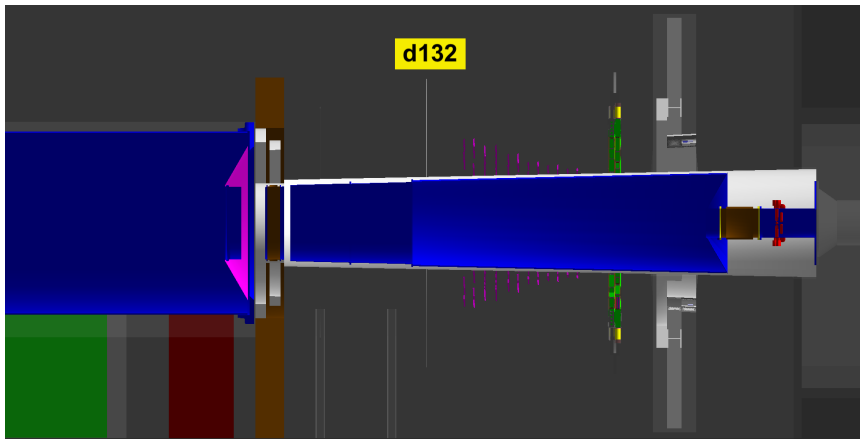


- The new configuration (#41) includes the changes on collar1, collimator6A/6B, US torus updates etc. (commit cd8d4e7)

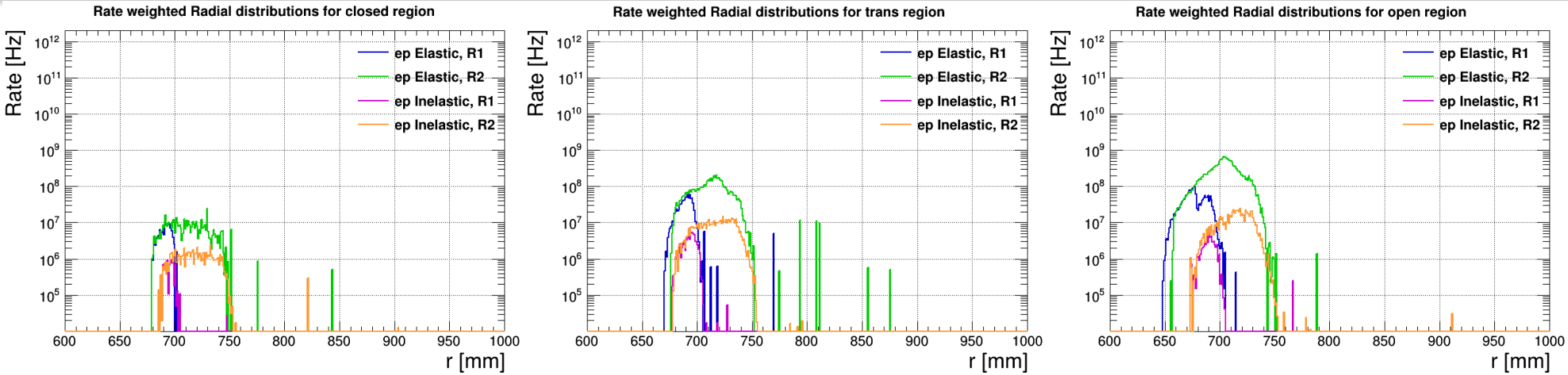
Analysis Procedure

- Ran the simulation with the ep elastic, and ep inelastic physics generators for 6M events
- Selected the primary hits of the e-/e+ with kinE > 1 MeV
  [Primary particle selection:
  (trackID = 1 && mtrackID = 0) for the ep Elastic/Inelastic events].

d132 (new z-position)		@21309.65mm	
Ring	Rmin	Rmax	L [mm]
1	613.82	643.82	30.00
2	643.82	703.82	60.00
3	703.82	763.82	60.00
4	763.82	883.82	120.00
5	883.82	1023.82	140.00
6	1023.82	1123.82	100.00



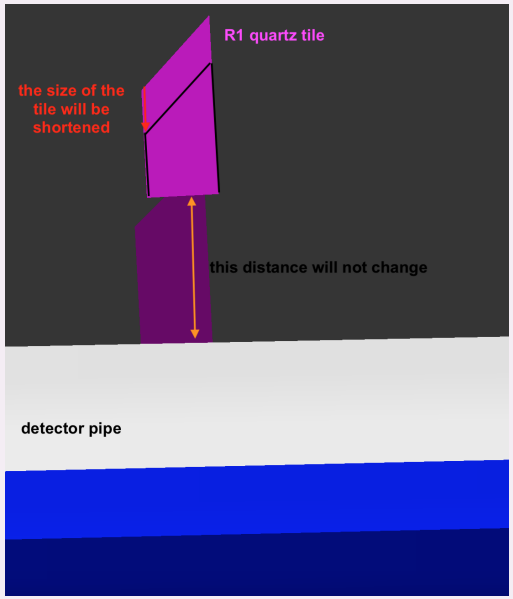
The comparison of rate-weighted radial distributions for Ring1 and Ring2



The rate weighted radial distributions of the R1 and R2 in the configuration 41 for closed (left), transition (middle), and open (right) sectors.

Suggested modification for R1 Tiles

- It is suggested to reduce the active area of the Ring1 tiles by 15mm. The distance between the minimum radial of R1 tiles and the beamline will keep the same.
- We will perform the deconvolution study once we have the GDML files which will be updated with this suggested modification.



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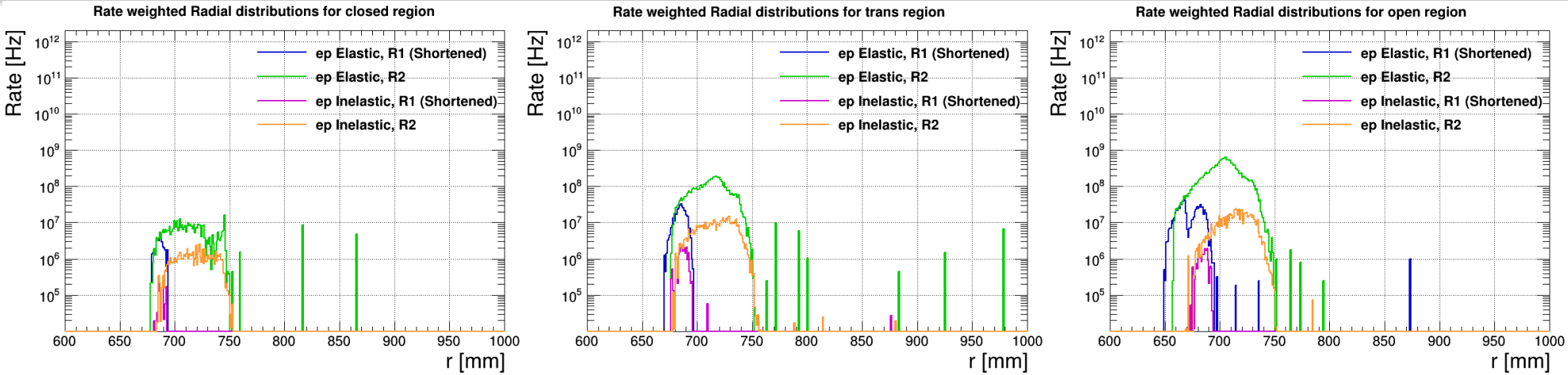
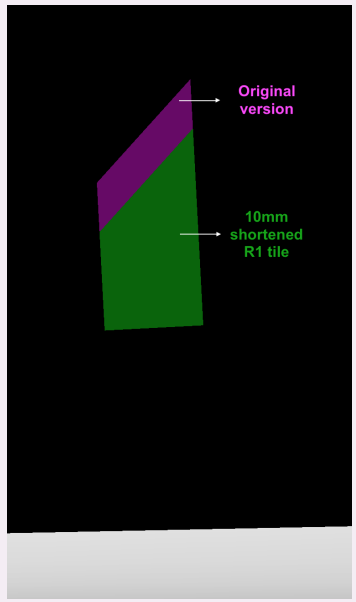


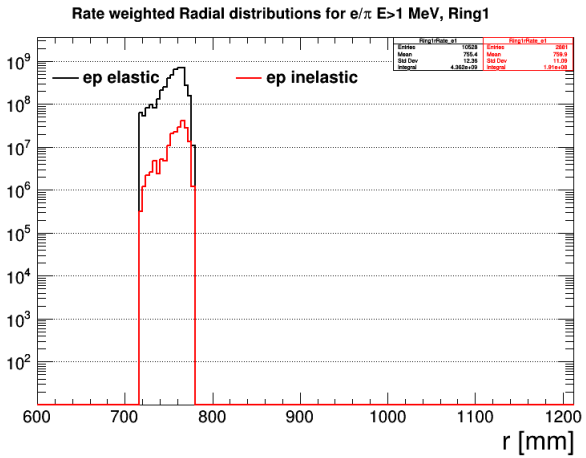
The rate weighted radial distributions of the R1 and R2 in the configuration 41 for closed (left), transition (middle), and open (right) sectors.

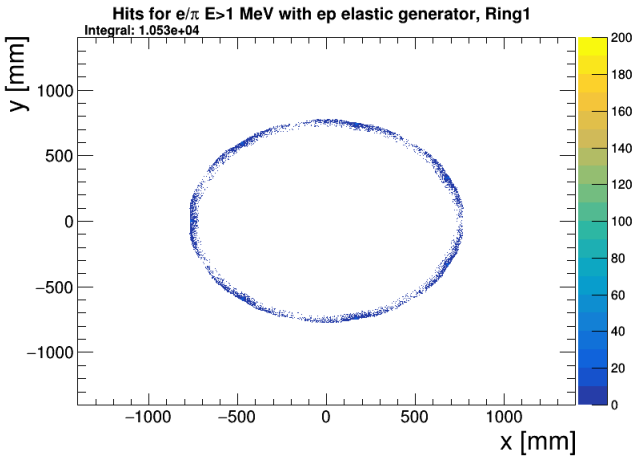
The modification for R1 Tiles

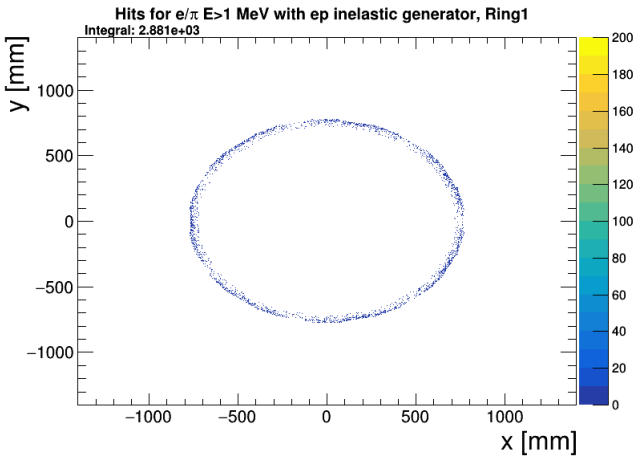
- The active area of the Ring1 tiles are shortened by 10mm while maintaining the same distance between the minimum radial of R1 tiles and the beamline.

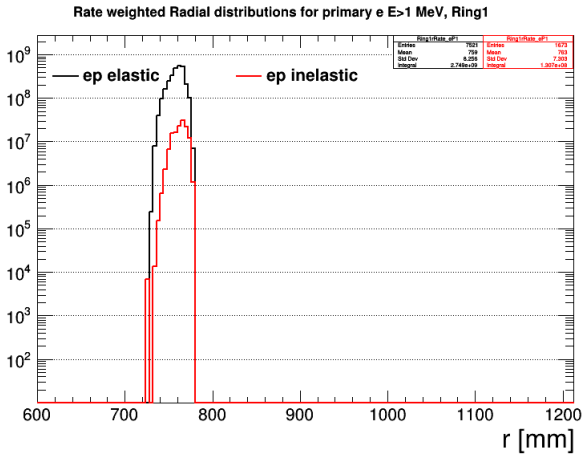


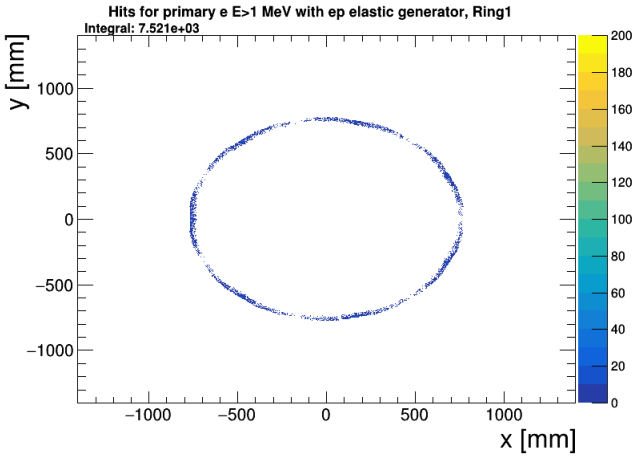
Hit/Radial distributions, Ring1

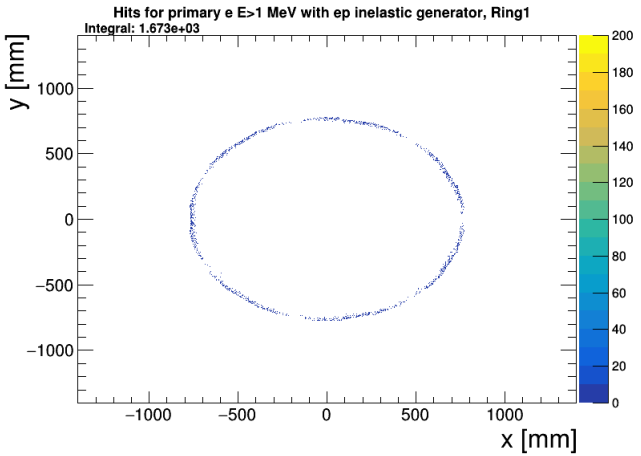






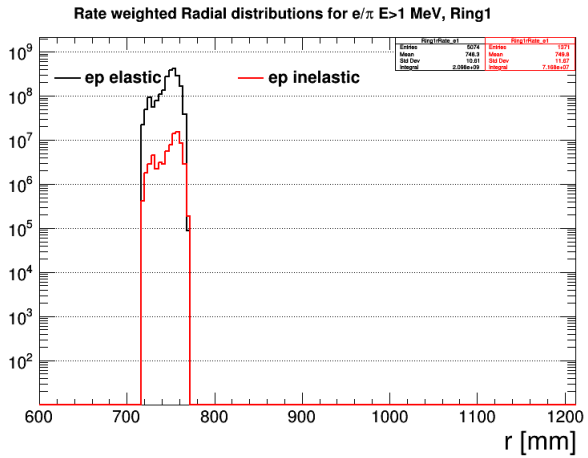


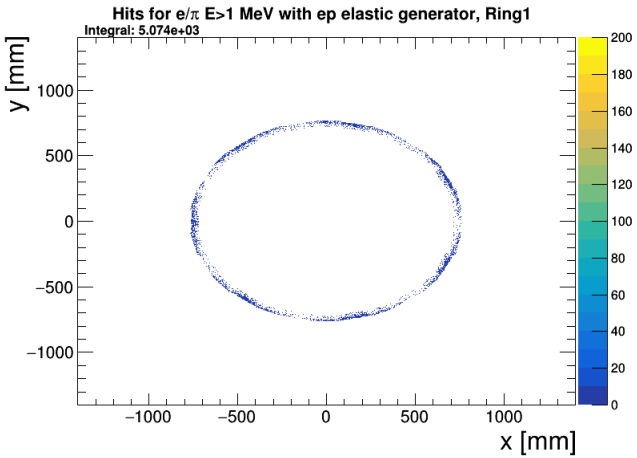


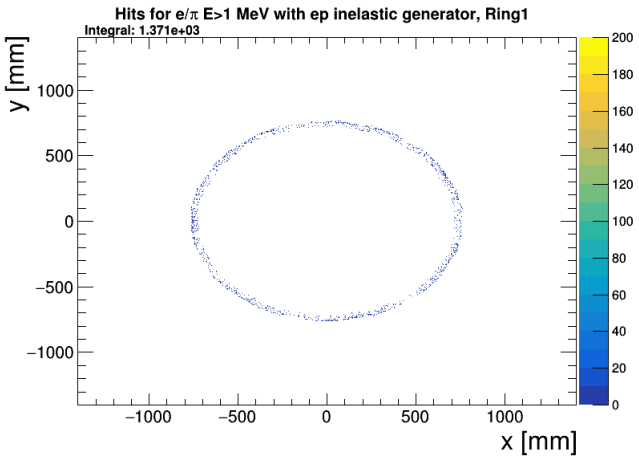


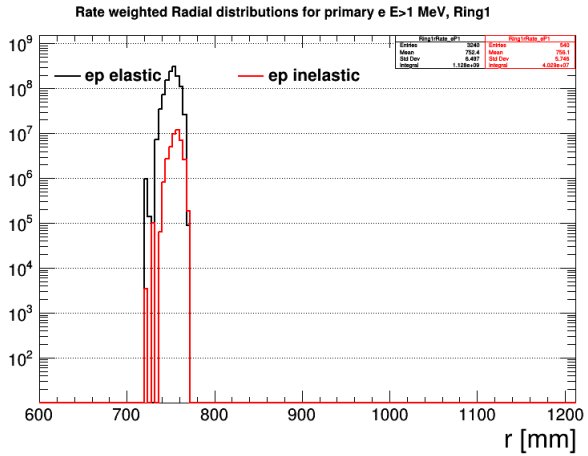
The top plots show the primary and secondary e/pi events with E > 1 MeV, while the bottom plots show primary particles with E > 1 MeV. Here, the 2D hit distributions of particles at Ring1 are also shown. Additionally, the rate and rate*energy weighted hit distributions can be found in the backup slides.

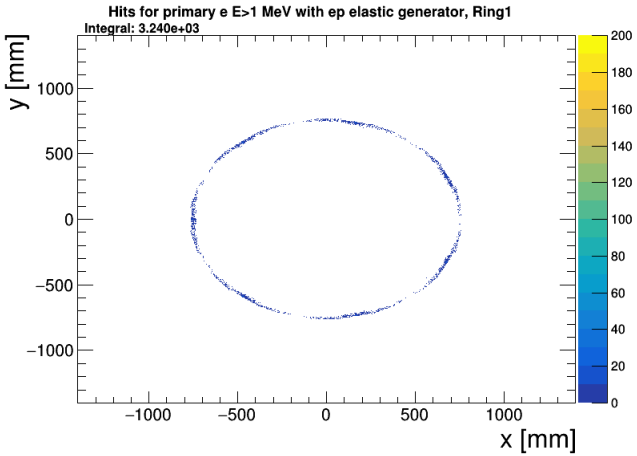
Hit/Radial distributions, Ring1, Shortened R1 tiles

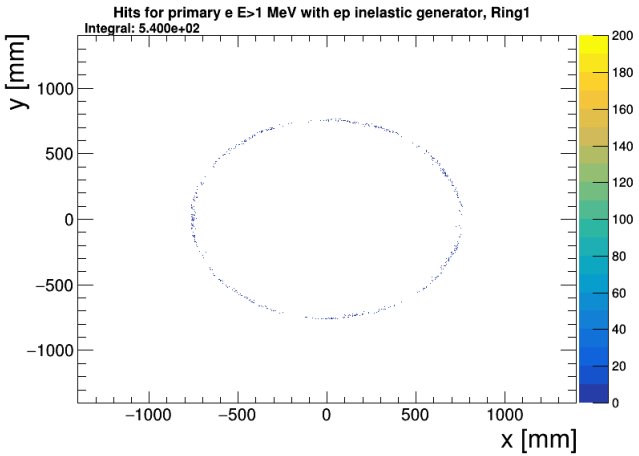












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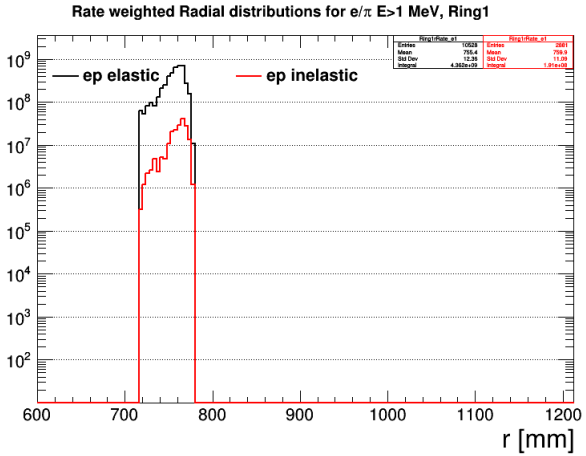
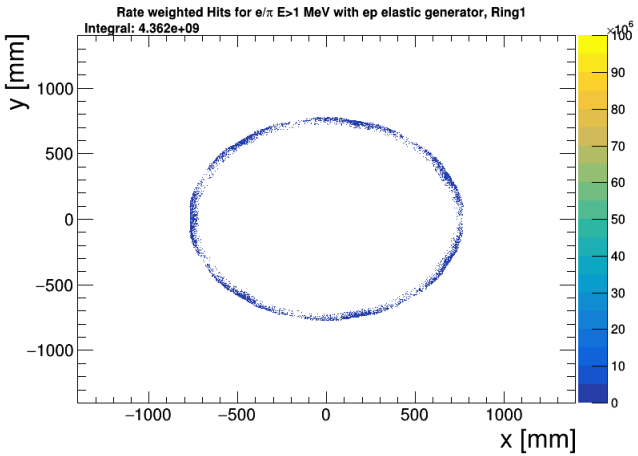
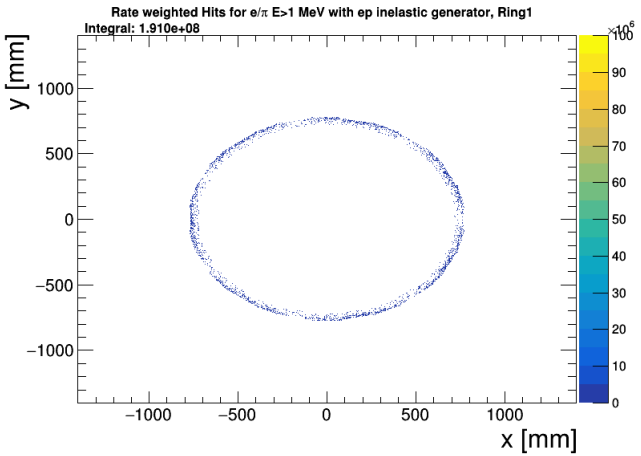
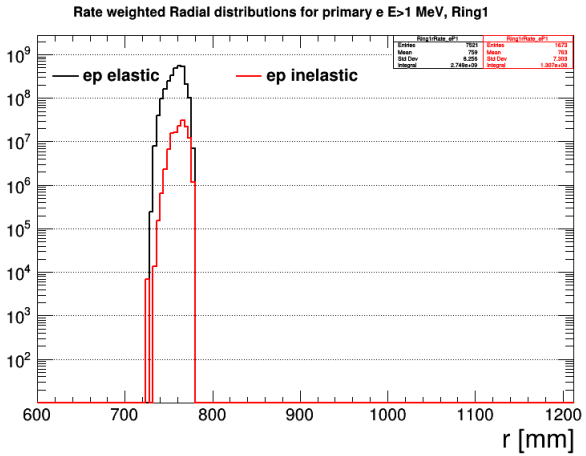
Backup

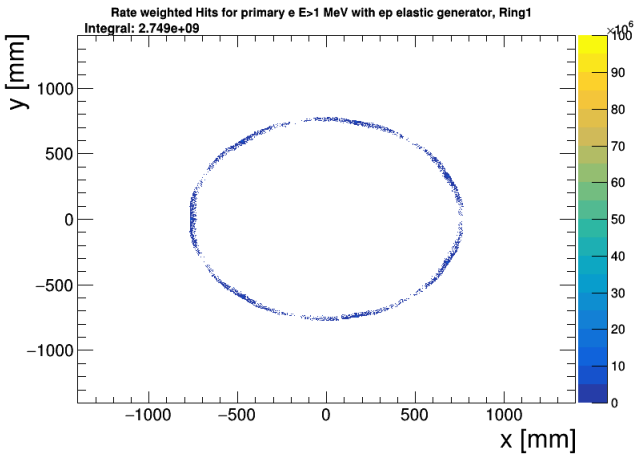
Hit/Radial distributions, Ring1

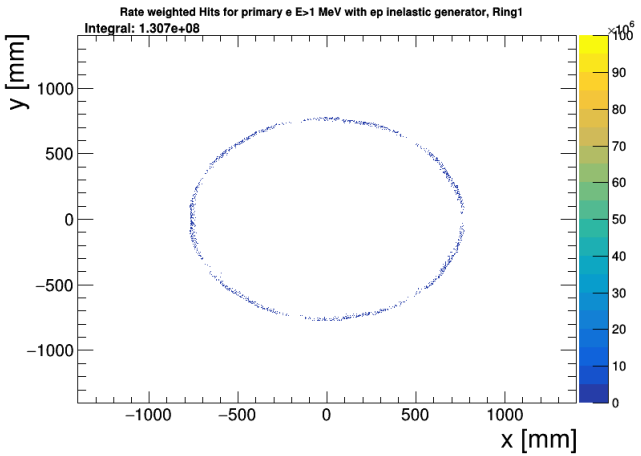












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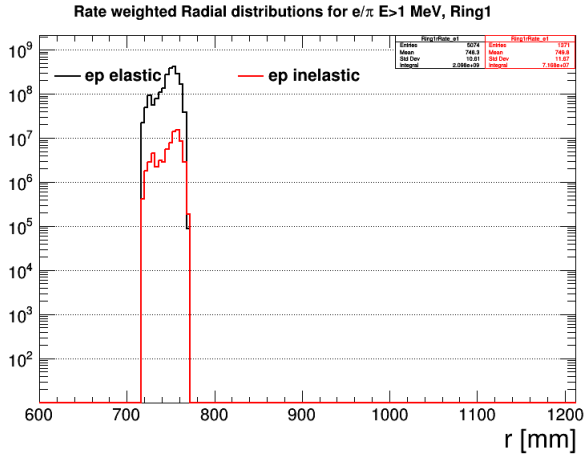

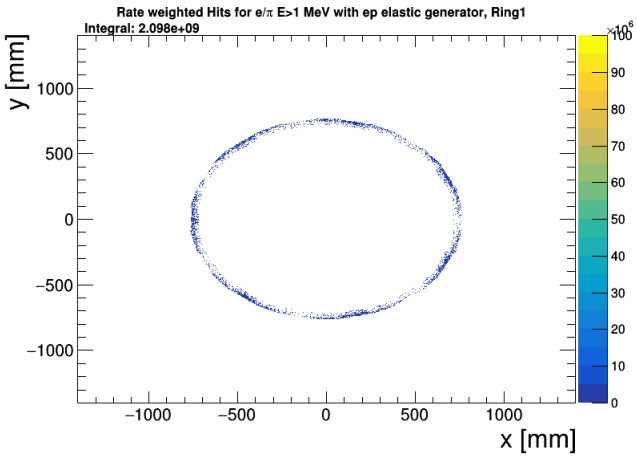

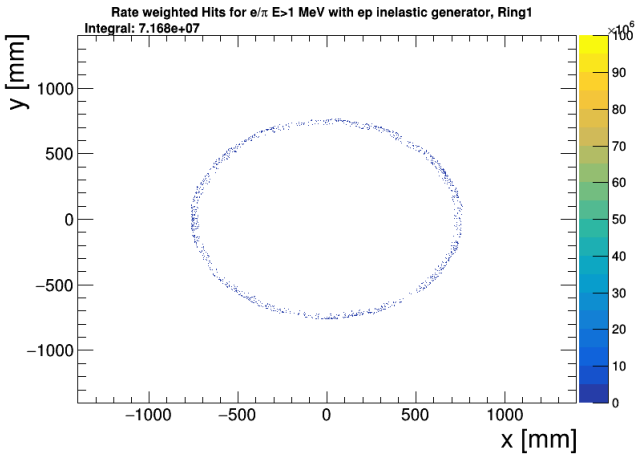

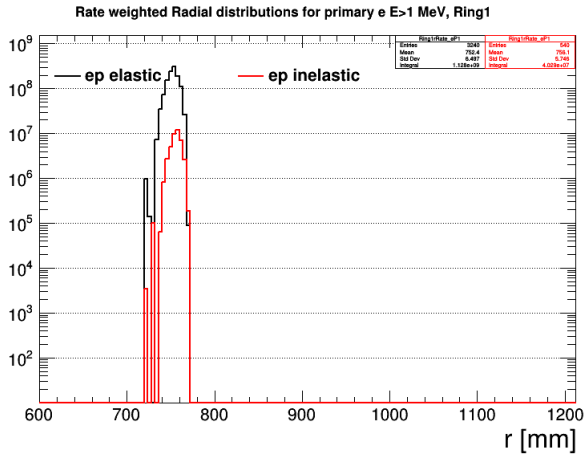

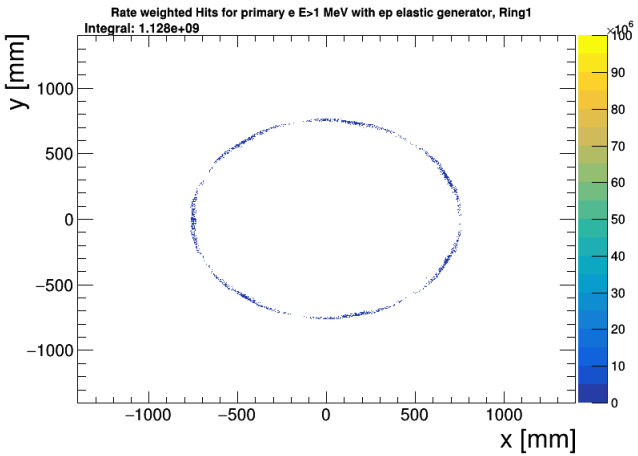

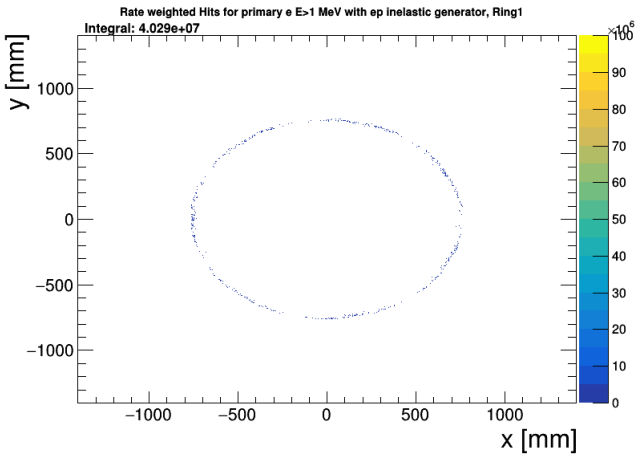

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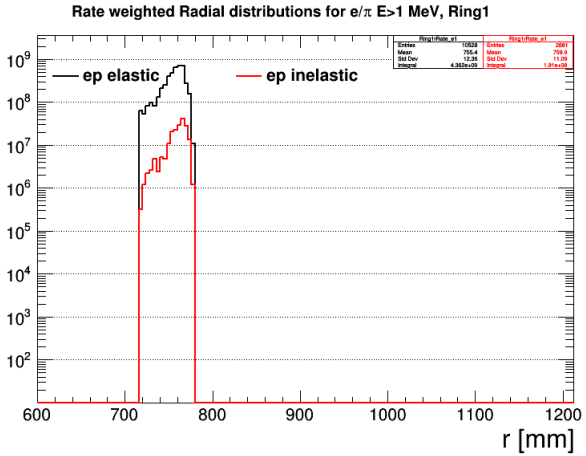

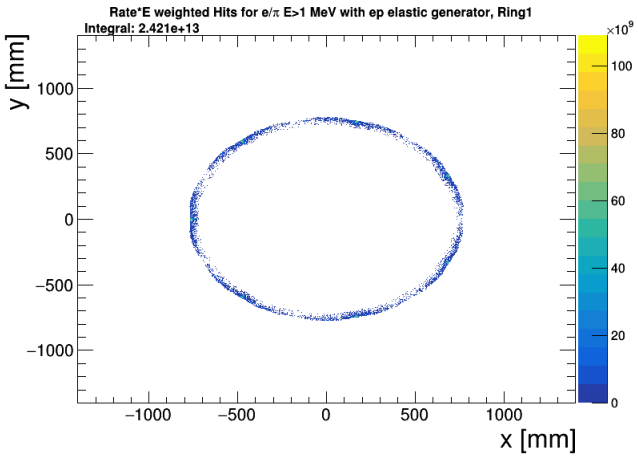

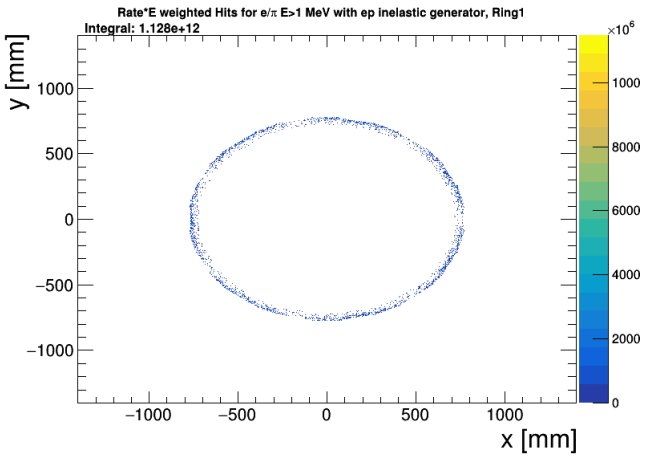

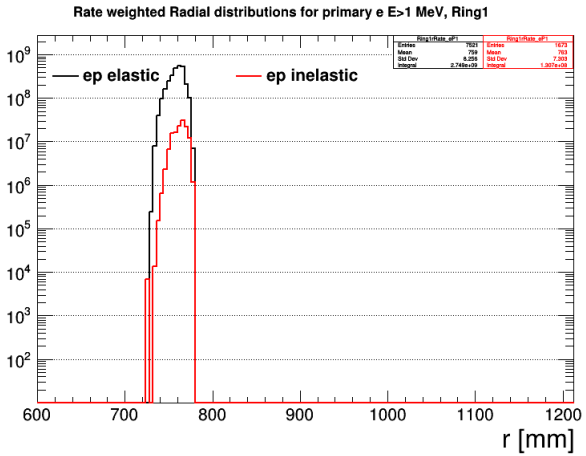

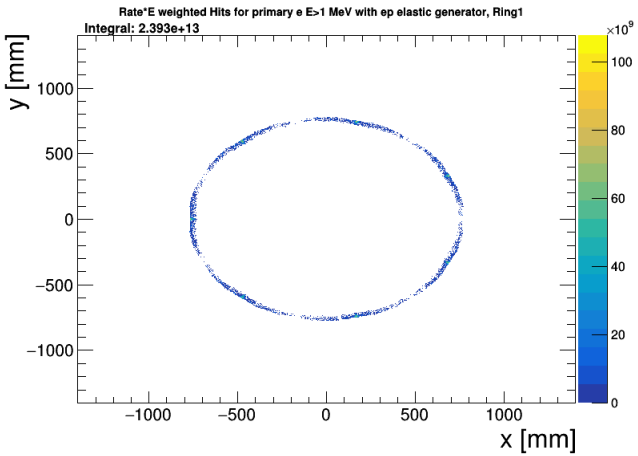

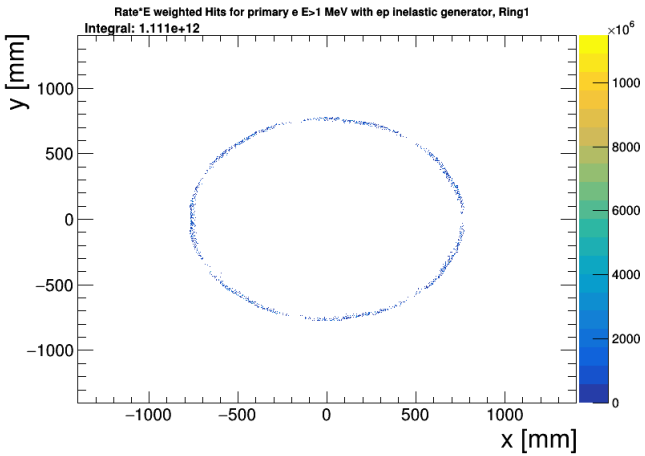

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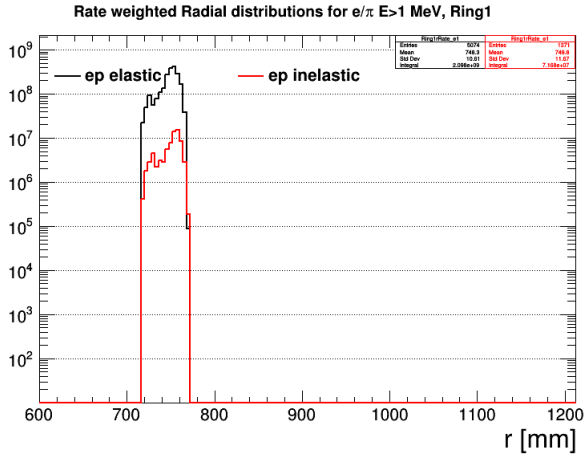

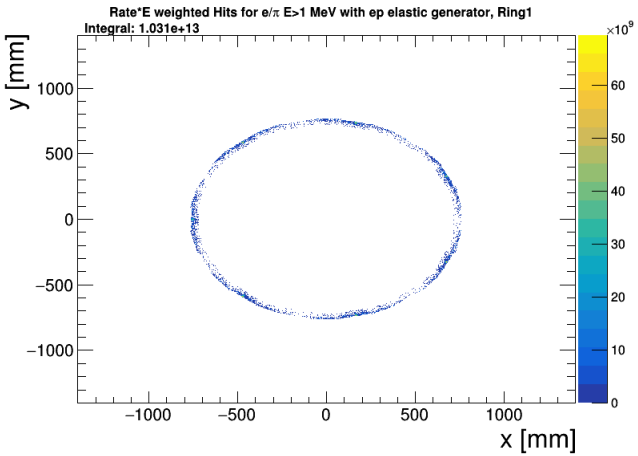

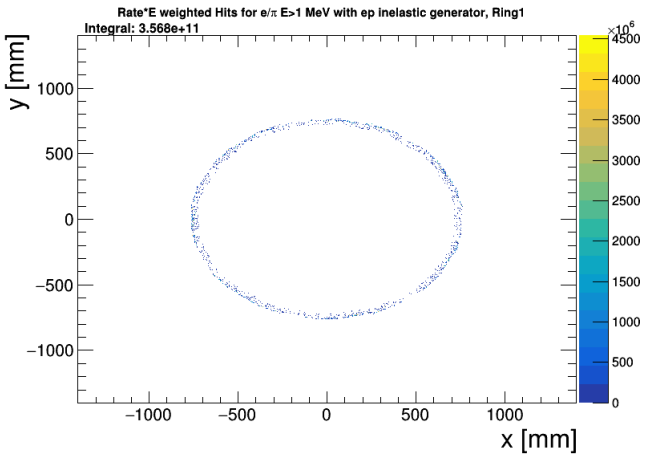

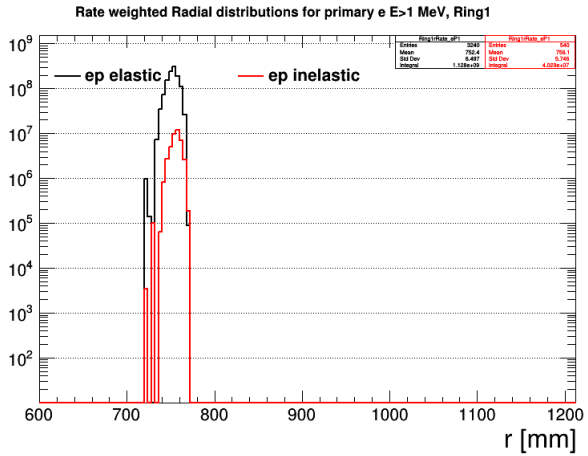

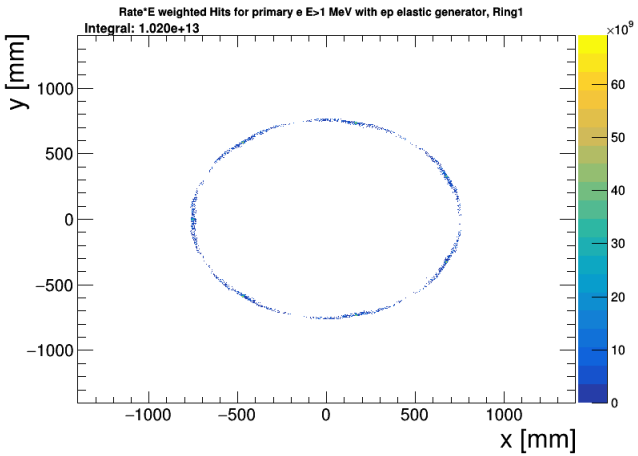

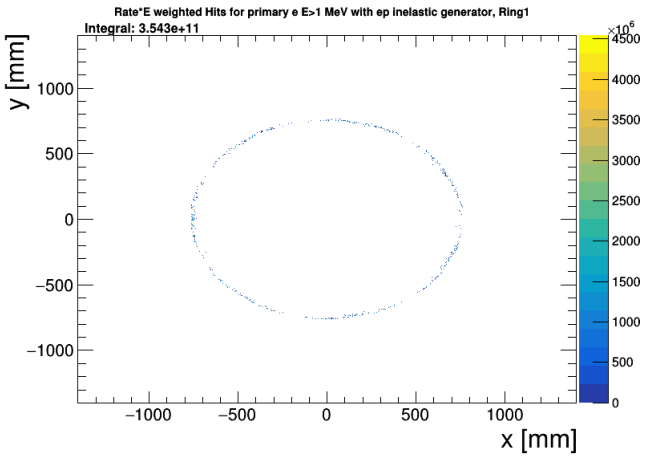

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