Status of Tracking for Agata

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Online Tracking

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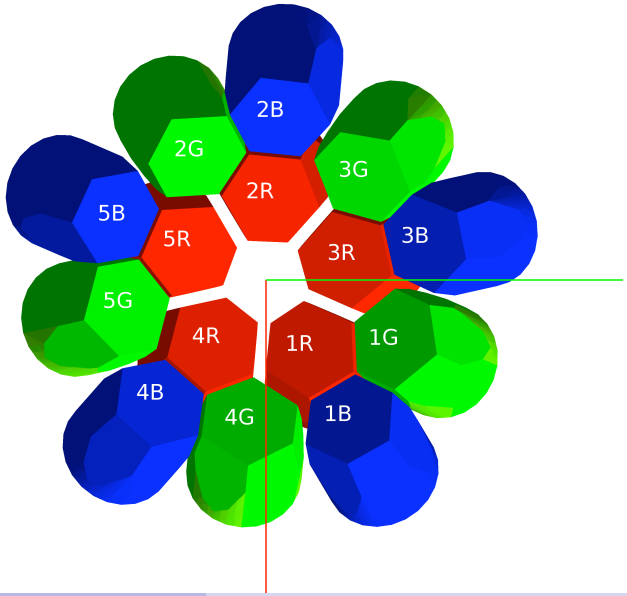
  $\longrightarrow$ 4x faster

  $\longrightarrow$ tracking no longer bottleneck of the DAQ

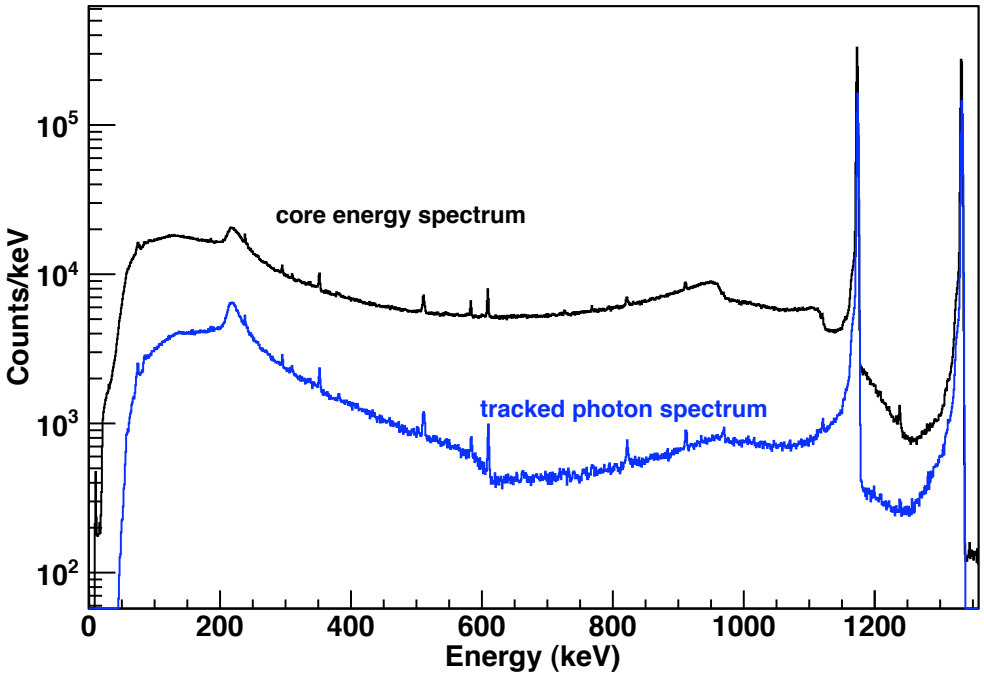
Source run

- tracking with source data taken in April 2010:

  - 3 triple clusters : ATC1, ATC2, ATC4 (NB: non adjacent detector !)
  - ^{60}Co @ z=27.2 cm (nominal position : z=0)
  - PSA interaction points (actor revison # 879) written to Agata-type file

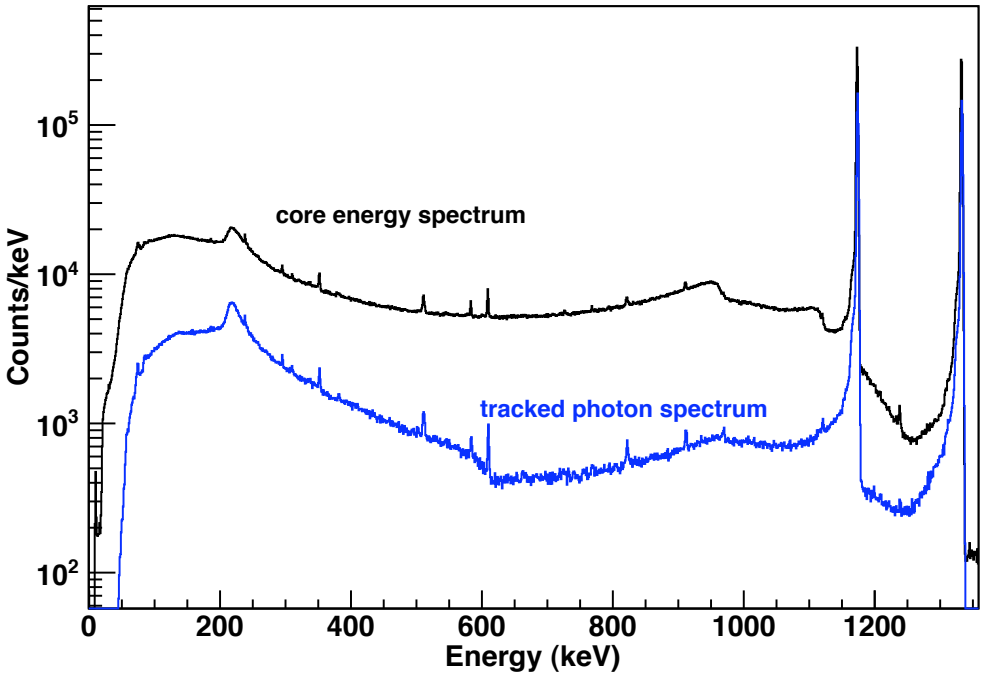


Issues



- P/T∼35% and $\epsilon_{tracking}$ ∼53% (with standard tracking parameters)

Issues



- P/T∼35% and $\epsilon_{tracking}$ ∼53% (with standard tracking parameters)
- single-hit threshold

Why such a performance ?

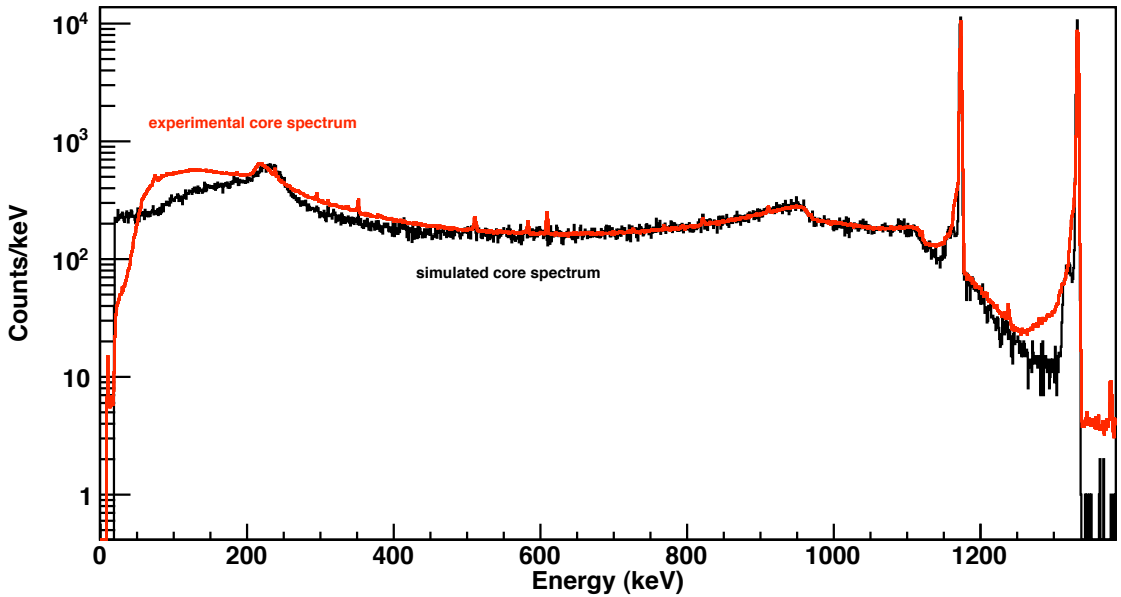
- use AGATA simulation code to try to find the origin(s) of the problems

  configuration of the simulations:

  - ATC1,2,4 with passivated areas, capsules and cryostats
  - 2 mm Al chamber
  - PRISMA ancillary (pushed back by 8 cm wrt nominal position @ Z=40 cm)
  - packing per segment at the energy-weighted barycenter
  - standard energy resolution for segments
  - 20-keV threshold on segment energy
  - emission multiplicity = 2

Why such a performance ?

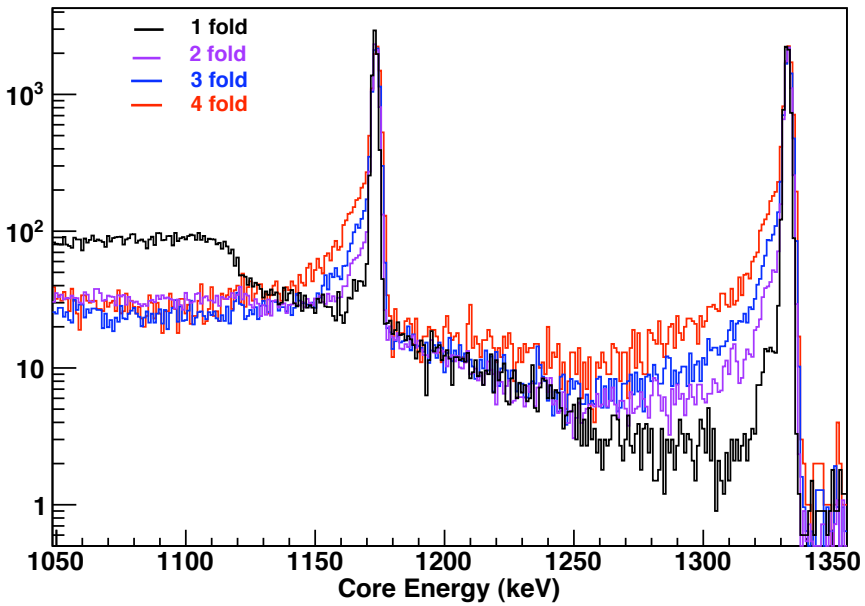
core-energy spectra normalised to peak+tail



- worse experimental input spectral quality (P/T=15% vs 19%)

Tails

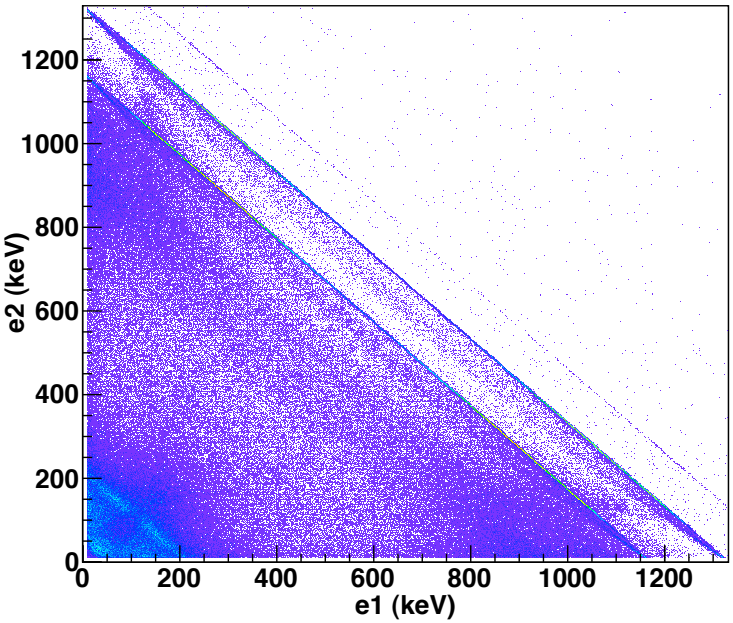
core-energy spectra normalised to peak



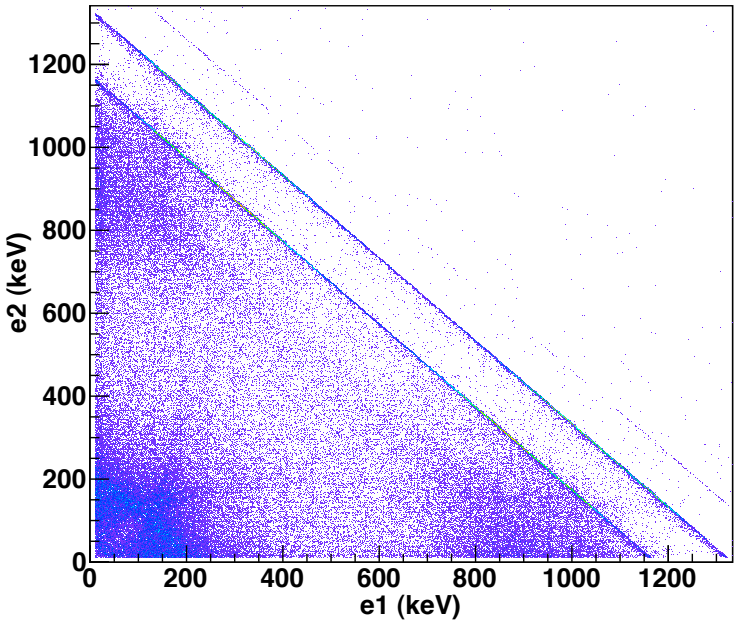
- tails appear for events with more than 1 segment hit in a detector

Tails

fold 2 (slice1)



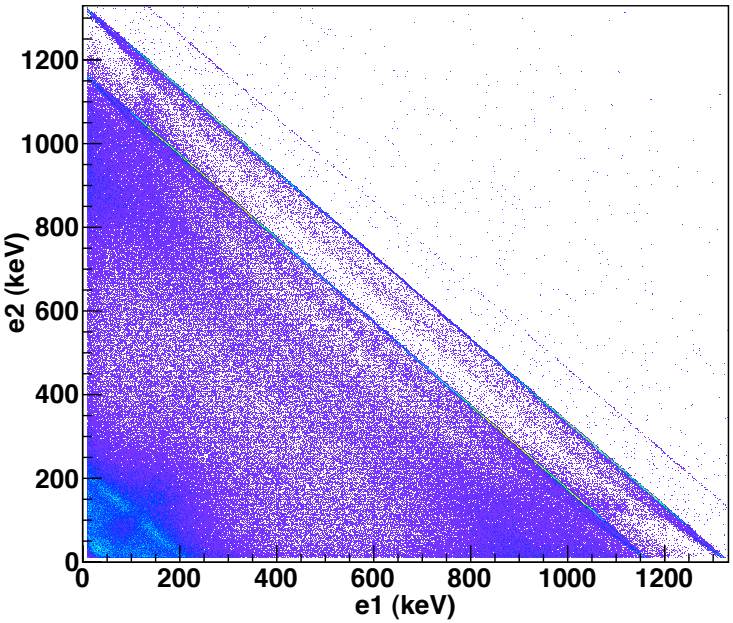
fold 2 (slice2)



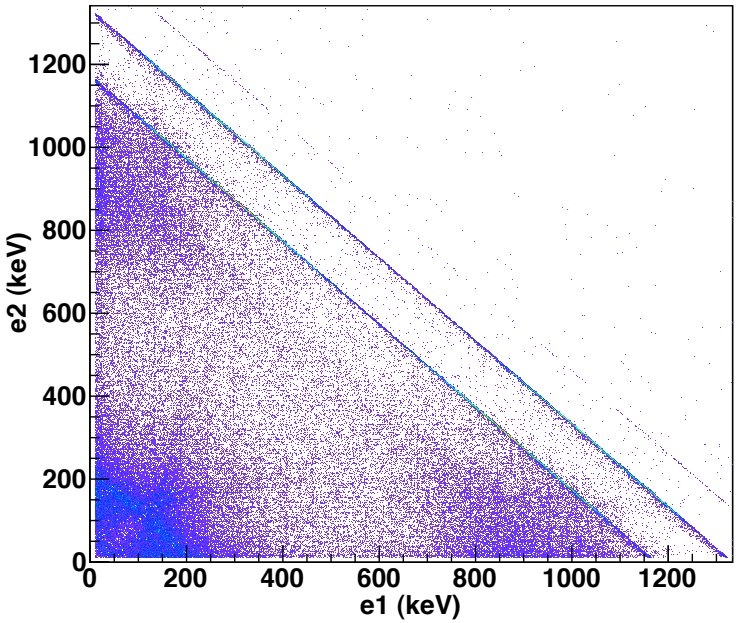
- Bow effect

Tails

fold 2 (slice1)



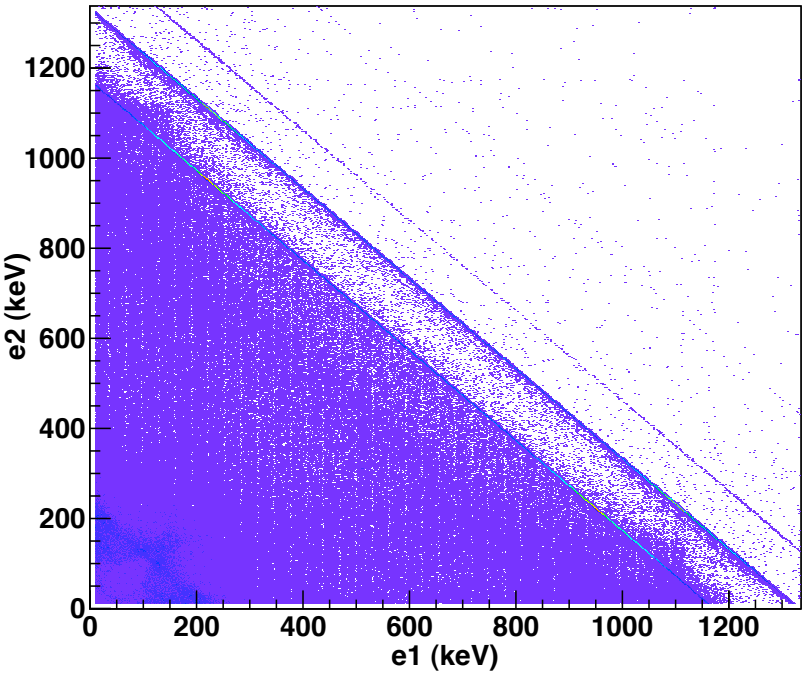
fold 2 (slice2)



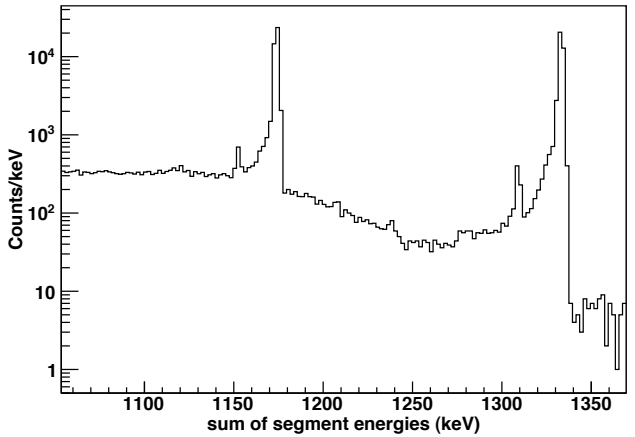
- Bow effect
- How does this affect interaction positions ?

Tails

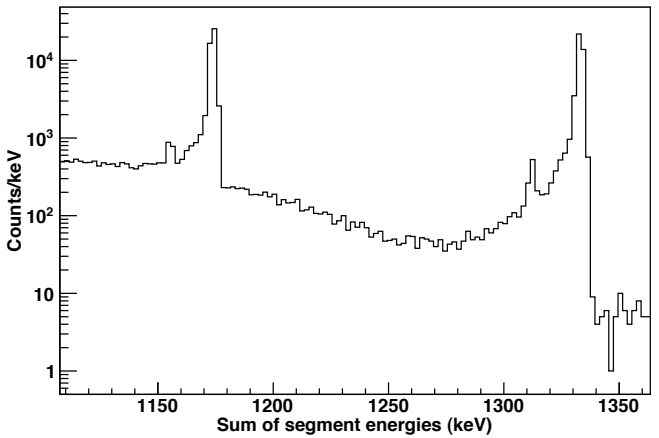
fold 2 (coinc. between slices 2-3)



fold 2 slices 2-3



fold 2 slices 1-2



Tails

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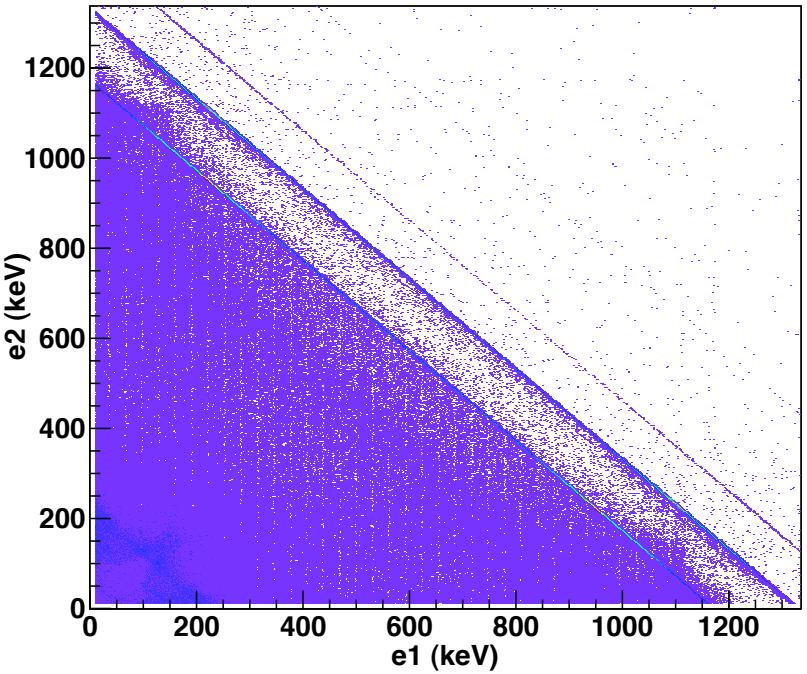
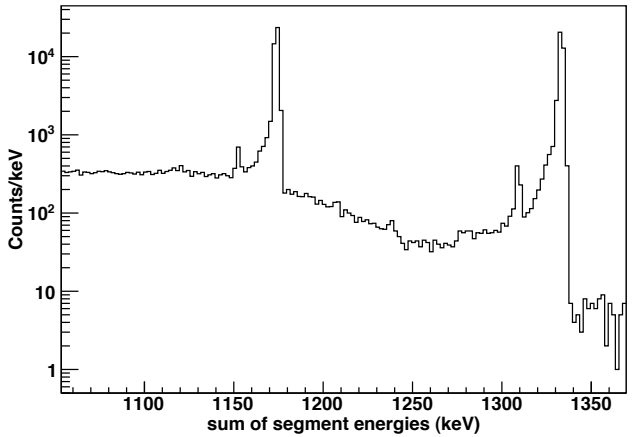


- problem arises with coincident segs A1,A2,A3 (individual spectra OK)

fold 2 slices 2-3



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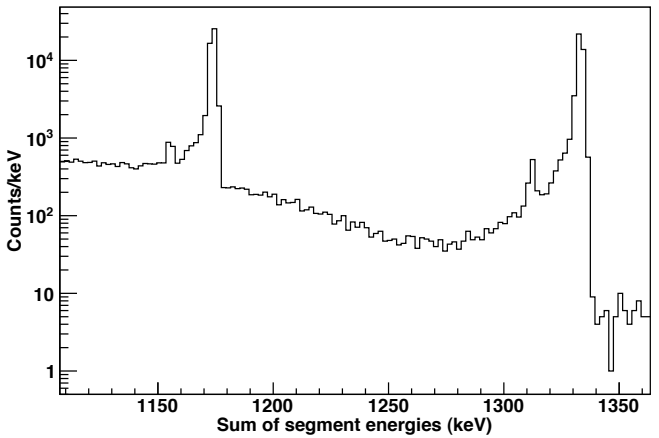
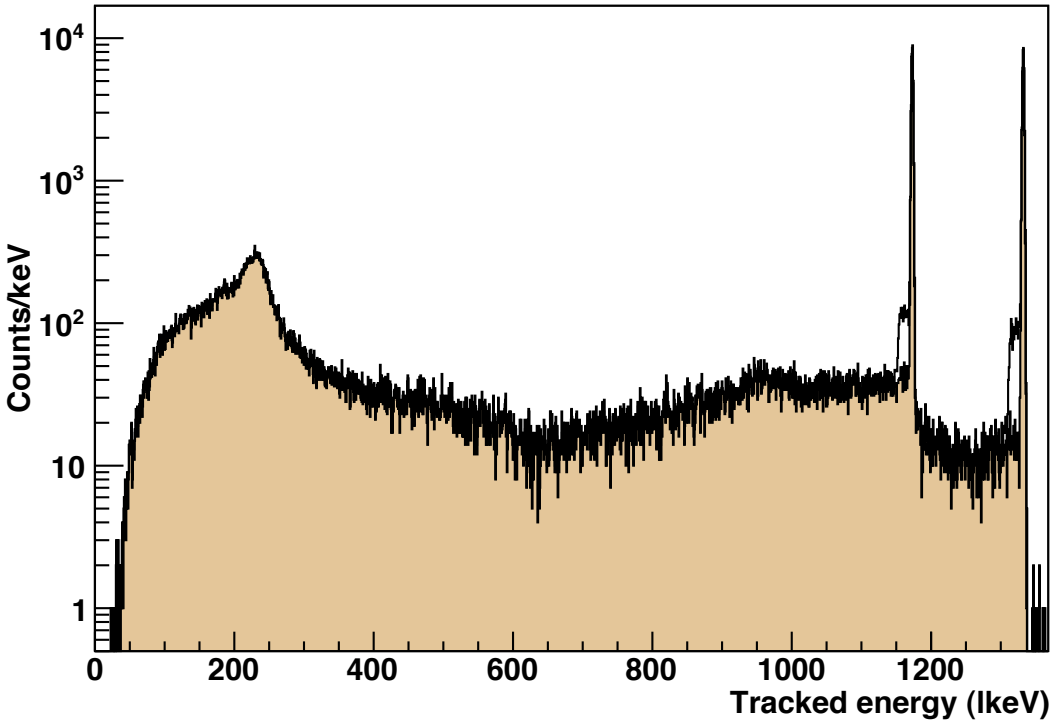


Core-energy correction

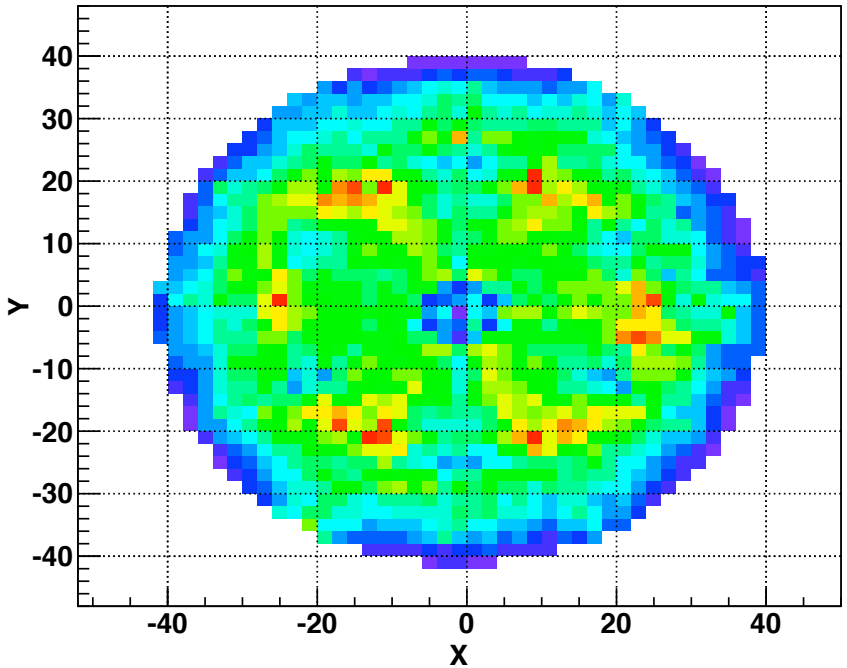
difference between core energy and $\Sigma e_{segments}$ is redistributed among all interaction points



- peak is recovered (+5%) and P/T : 45% $\rightarrow$ 47%

Distribution of interaction points

april 2010



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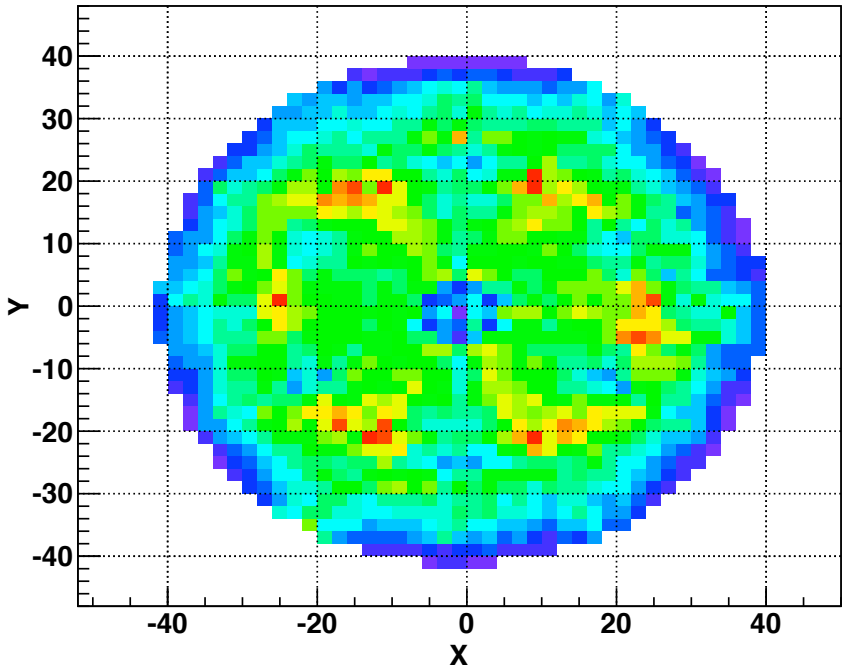
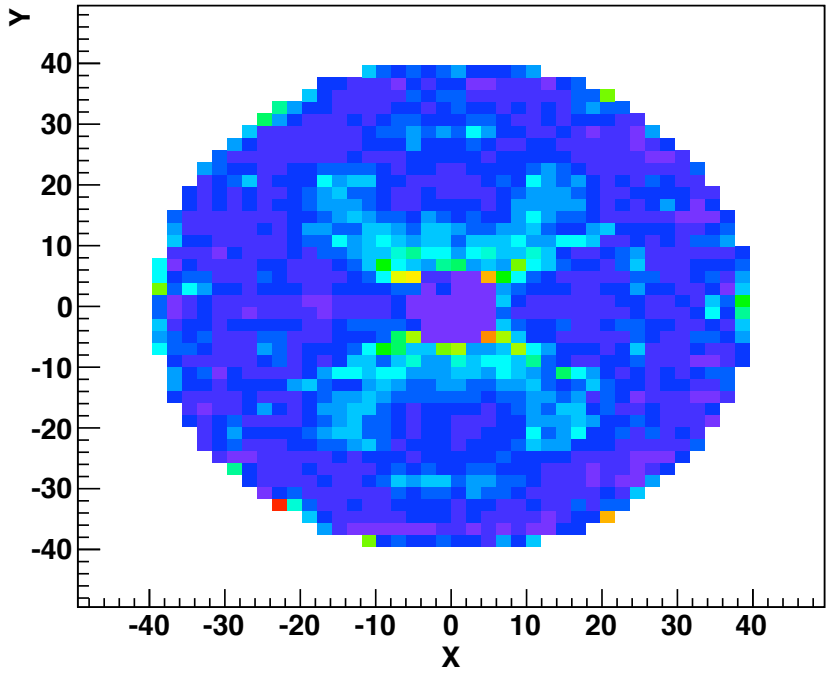
april 2010

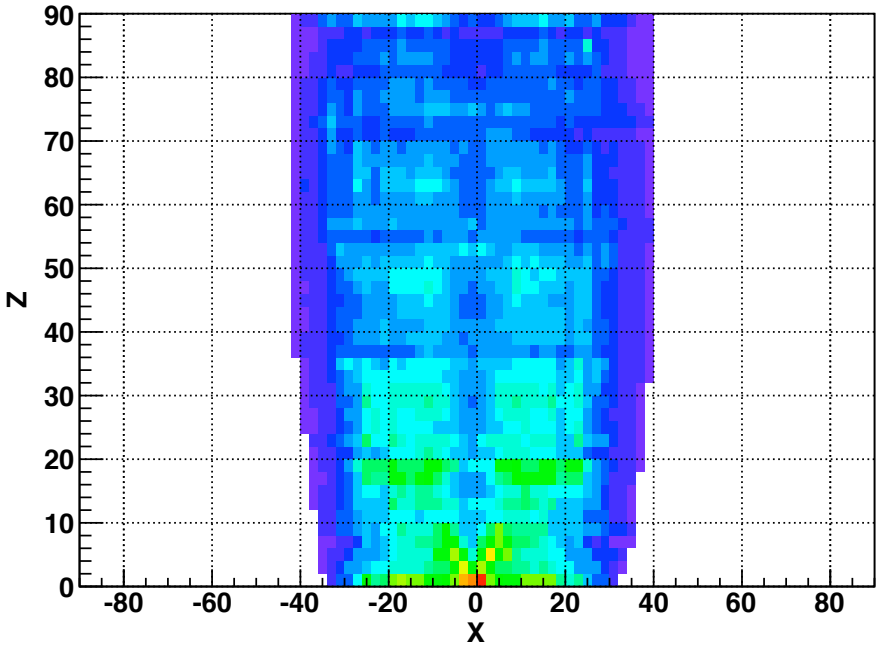


august 2009



- smoother (X,Y) distribution & 6-fold symmetry

Distribution of interaction points



- But - clustering of interaction points & quantization in depth

To do (help is welcome!)

- improve quality (reality) of simulations to understand tracking response
- modifiy single-interaction treatment to account for high-energy single interactions and depth quantization
- compare mgt/OFT
- track with core-energy-corrected data (replay recently performed)