

Comparing GenDecay with old generators

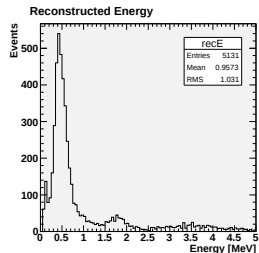
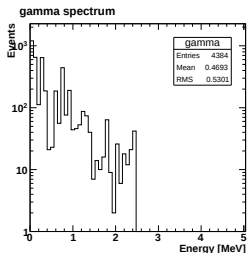
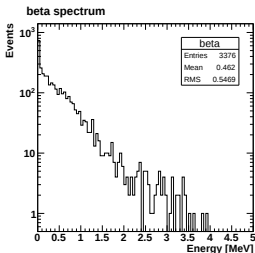
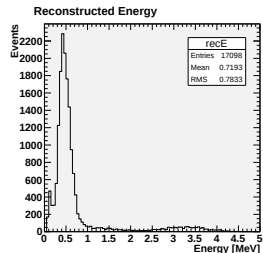
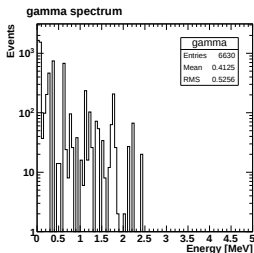
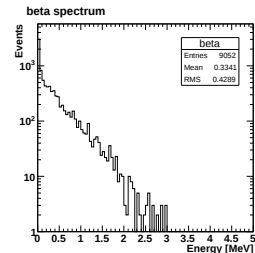
Qing He

Princeton University

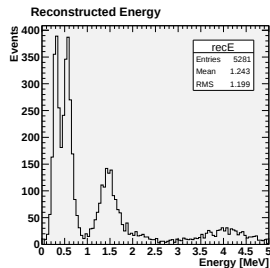
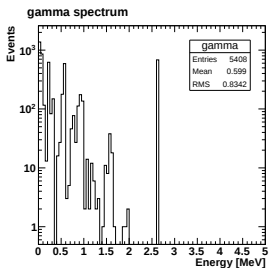
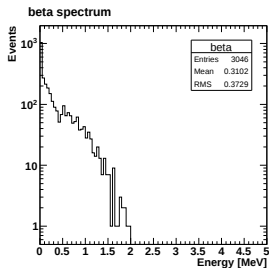
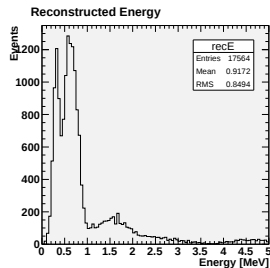
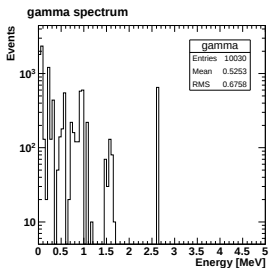
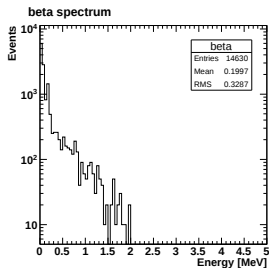
Dayabay Collaboration

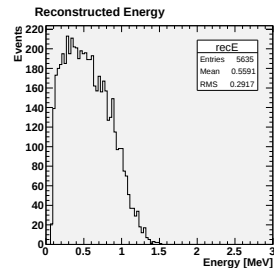
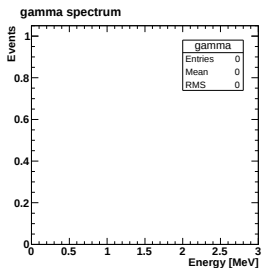
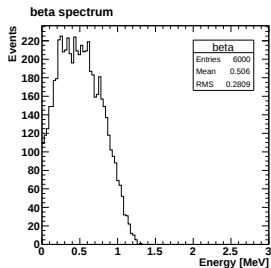
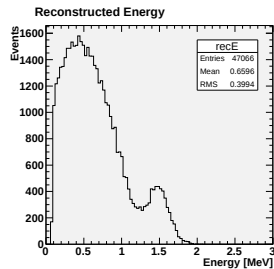
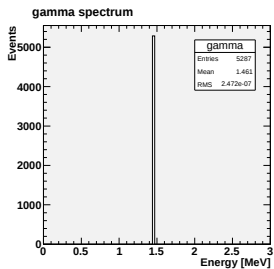
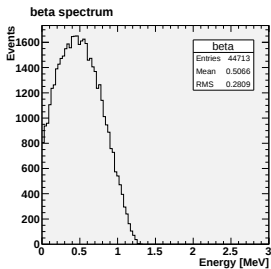
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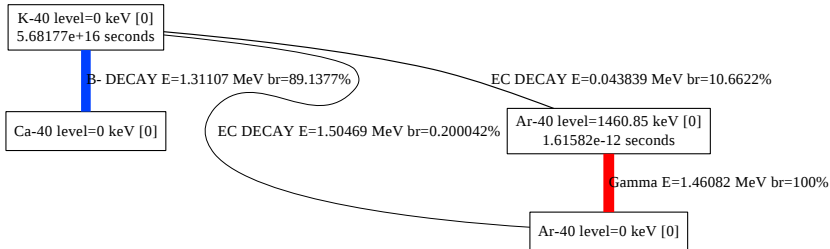
- Assume Secular Equilibrium.
- Correlation time in GenDecay is 1 s.
- Iterate over the generated particles to get the spectra.
- β , γ and reconstructed energy spectra are compared.



● First row: Old generator; Second row: GenDecay

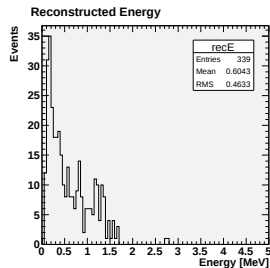
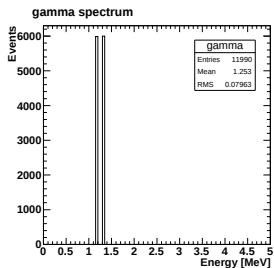
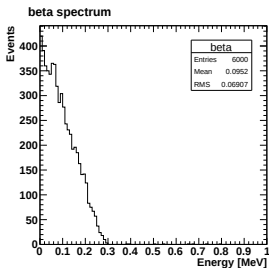
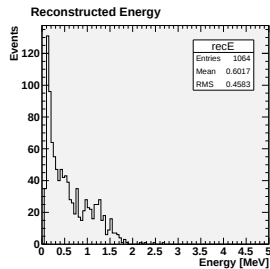
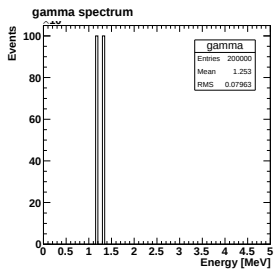
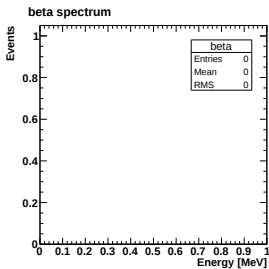






- No γ spectrum is seen in GenDecay
- Print out from GenDecay:

```
visiting K-40 -> Ca-40 B- DECAY E=1.31107 MeV br=89.1377%
For K-40 -> Ca-40 setting rate = 4.7222
visiting K-40 -> Ar-40 EC DECAY E=1.50469 MeV br=0.200042%
For K-40 -> Ar-40 setting rate = 0.0105975
visiting K-40 -> Ar-40 EC DECAY E=0.043839 MeV br=10.6622%
For K-40 -> Ar-40 setting rate = 0.564846
visiting Ar-40 -> Ar-40 Gamma E=1.46082 MeV br=100%
```



- Only two γ 's generated in standalone generator.
- GenDecay provides more reasonable decays.

visiting Co-60 -> Ni-60 B- DECAY E=1.492 MeV br=0.12%

For Co-60 -> Ni-60 setting rate = 4.5503e+07

visiting Ni-60 -> Ni-60 Gamma E=1.3325 MeV br=100%

visiting Co-60 -> Ni-60 B- DECAY E=0.31788 MeV br=99.88%

For Co-60 -> Ni-60 setting rate = 3.78737e+10

visiting Ni-60 -> Ni-60 Gamma E=0.34693 MeV br=0.00759942%

visiting Ni-60 -> Ni-60 Gamma E=0.82606 MeV br=85.034%

visiting Ni-60 -> Ni-60 Gamma E=2.15857 MeV br=14.966%

visiting Ni-60 -> Ni-60 Gamma E=1.17324 MeV br=99.9924%

visiting Ni-60 -> Ni-60 Gamma E=2.50577 MeV br=1.99985e-06%