ALICE Geant4 News

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For the ALICE Collaboration

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Productions

- General purpose productions running with Geant3 and Geant4
  - Geant4 10.1.p03, FTFP_BERT_EMV physics lists with a special MSC model in EMCAL region
- Geant4 considered as default for upcoming Quark Matter ’18 Productions

Production (2017)	Name	Status	Events	Running time	Saving time	Disk space
LHC17l4b_fast	p-p, 5.02 TeV - General-purpose Monte Carlo production anchored to LHC17p/q (pp reference run) with Geant4, FAST, ALIROOT-7623	Running	191,214,800	520y 358d	5y 28d	50.7 TB
LHC17l4b_cent_woSDD	p-p, 5.02 TeV - General-purpose Monte Carlo production anchored to LHC17p/q (pp reference run) with Geant4, CENT, noSDD, ALIROOT-7623	Running	107,466,800	292y 3d	3y 7d	28.51 TB
LHC17l4b_cent	p-p, 5.02 TeV - General-purpose Monte Carlo production anchored to LHC17p/q (pp reference run) with Geant4, CENT, ALIROOT-7623	Running	107,849,600	294y 292d	3y 100d	28.83 TB
LHC16h7c_g4_2	Pb-Pb, 5020 GeV, Hijing plus injected nuclei, Geant4, hypernuclei and exotica, 50-90% cent, updated AliRoot, LHC15o anchors, ALIROOT-6825	Completed	420,000	11y 236d	17d	3.586 TB
LHC17c4e_hack	p-p, 7 TeV, General purpose MC with Geant4 anchored to LHC10b, no ZDC, dev TPC ionisation, custom configuration, ALIROOT-7121	Completed	10,752,000	26y 333d	257d	7.547 TB
LHC17g5a2	p-p, 8 TeV - Gamma+Jet events in pp collisions at 8TeV (anchor to 2012 runs), Geant4, ALIROOT-7267	Running	5,500,000	19y 345d	104d	3.92 TB
LHC17c4f	p-p, 7 TeV, General purpose MC with Geant3 anchored to LHC10b, no ZDC, dev TPC ionisation, ALIROOT-7121	Completed	10,885,750	21y 317d	116d	7.855 TB
LHC17c4e	p-p, 7 TeV, General purpose MC with Geant4 anchored to LHC10b, no ZDC, dev TPC ionisation, ALIROOT-7121	Completed	10,766,250	26y 220d	113d	7.525 TB
LHC17c4b_hits	p-p, 7 TeV, General purpose MC with Geant4 anchored to LHC10b, no ZDC, new AliRoot, hits stored, ALIROOT-7121	Completed	106,000	82d	5d	75.77 GB
LHC17c4d_hits	p-p, 7 TeV, General purpose MC with Geant3 anchored to LHC10b, no ZDC, new AliRoot, VDT, hits stored, ALIROOT-7121	Completed	108,500	86d	1d	316.5 GB
LHC17c4c_hits	p-p, 7 TeV, General purpose MC with Geant4 anchored to LHC10b, no ZDC, new AliRoot, VDT, hits stored, ALIROOT-7121	Completed	105,500	87d	1d	173.4 GB
LHC16h7c_g4	Pb-Pb, 5020 GeV, Hijing plus injected nuclei, Geant4, hypernuclei and exotica, 50-90% cent, LHC15o anchors, ALIROOT-6825	Completed	426,000	11y 216d	19d	4.312 TB
LHC17c4d	p-p, 7 TeV, General purpose MC with Geant3 anchored to LHC10b, no ZDC, new AliRoot, VDT, ALIROOT-7121	Completed	10,888,000	23y 316d	156d	7.833 TB
LHC17c4c	p-p, 7 TeV, General purpose MC with Geant4 anchored to LHC10b, no ZDC, new AliRoot, VDT, ALIROOT-7121	Completed	10,595,250	26y 258d	151d	7.397 TB
LHC17c4b	p-p, 7 TeV, General purpose MC with Geant4 anchored to LHC10b, no ZDC, new AliRoot, ALIROOT-7121	Completed	10,714,750	27y 80d	84d	7.479 TB
LHC17c4a	p-p, 7 TeV, General purpose MC with Geant4 anchored to LHC10b, no ZDC, old AliRoot, ALIROOT-7121	Completed	10,039,750	34y 48d	85d	7.34 TB
			487,838,950	**1339y 1d**	**14y 156d**	**173.4 TB**

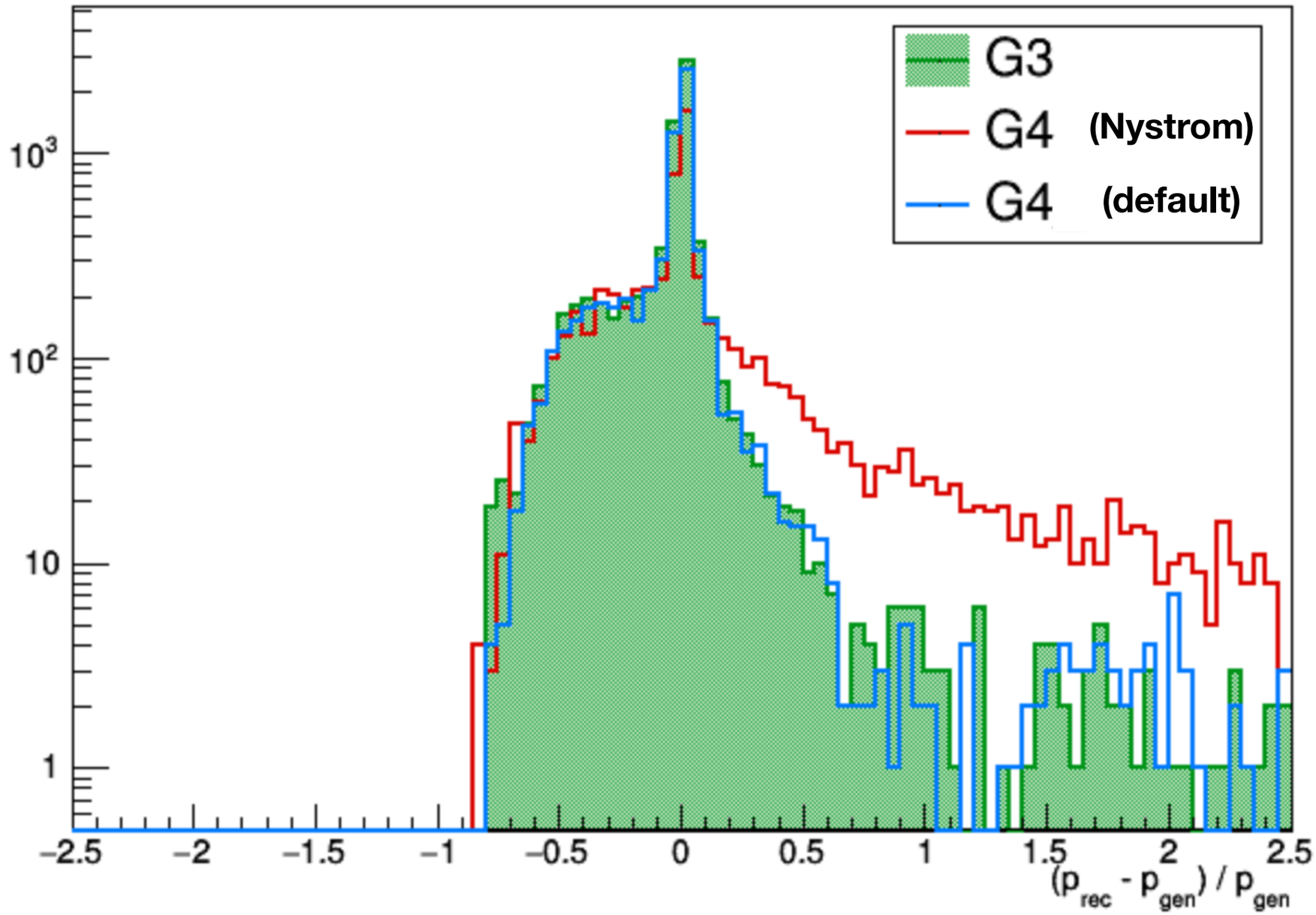
Validation → Analysis QA → General-purpose productions

Performance

Using default stepper

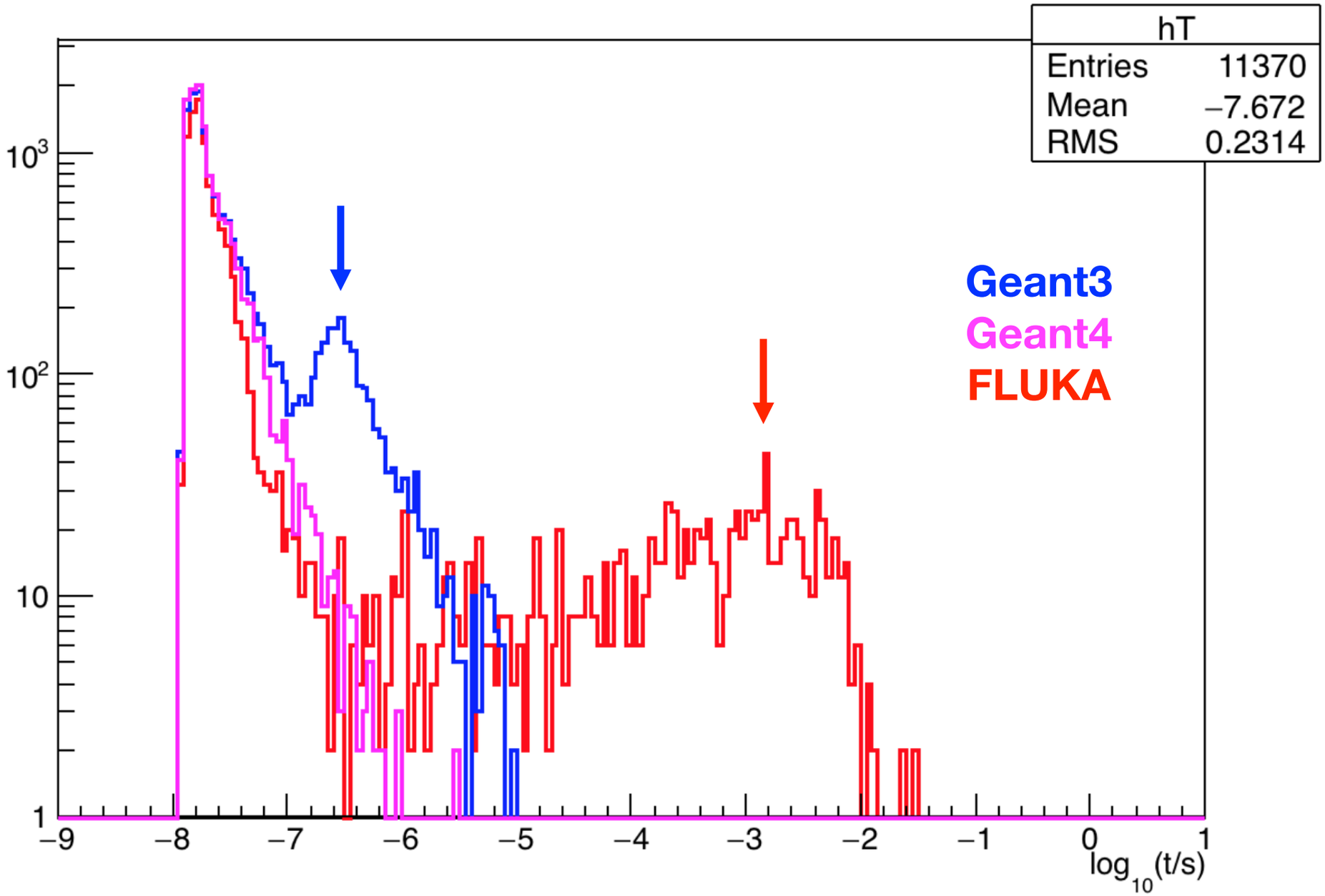
- Similar output size, G4 ~ **1.02** x G3
- Identical average memory consumption
- Full running time, G4 ~ **1.1** x G3

Solved: Problem with Nystrom Stepper



Kink (π,K →μX) daughters have been transported with the momentum of the mother

Puzzling but not a serious problem: Late neutrons



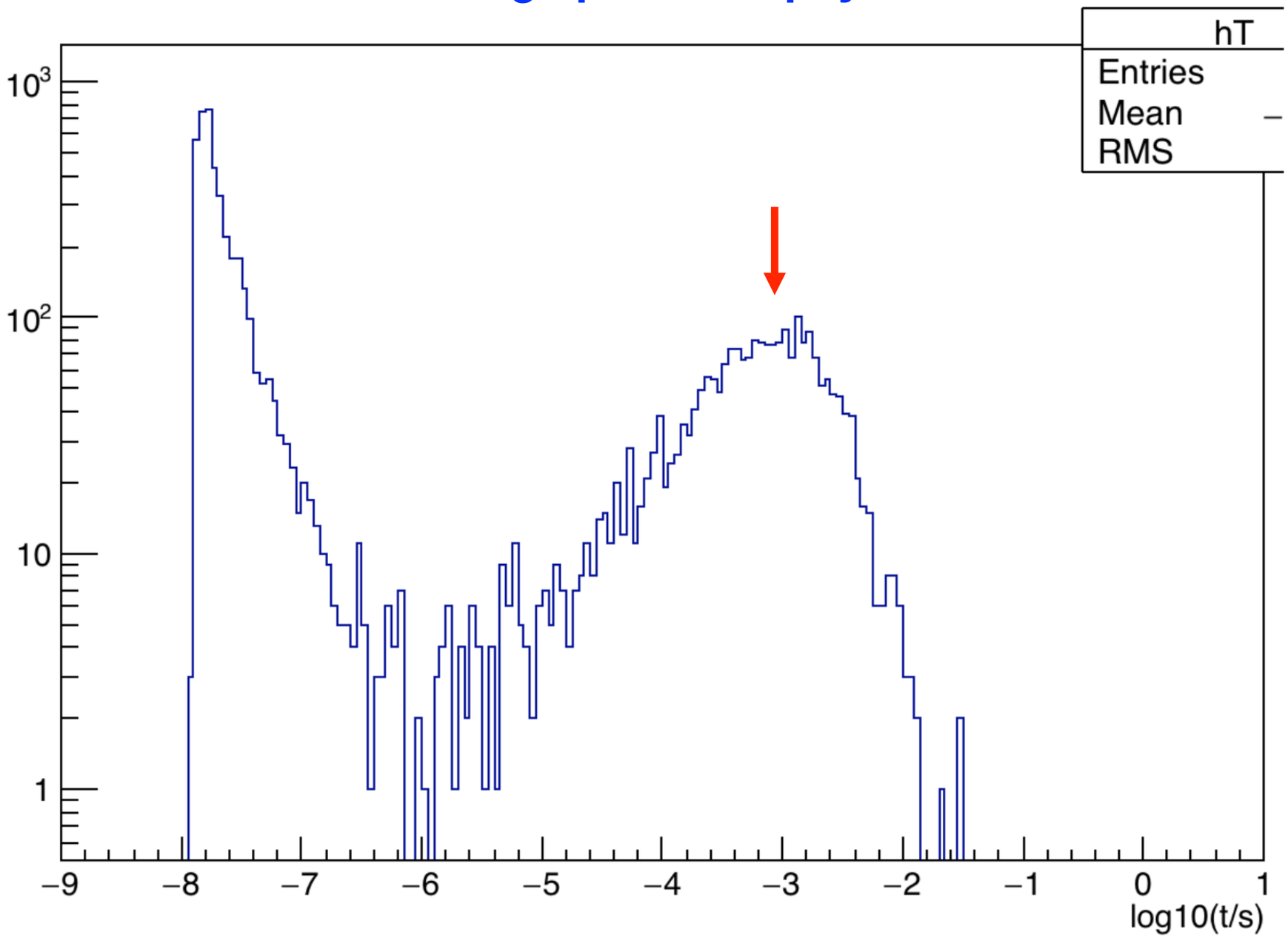
Very different time distribution of charged particles entering TOF

FLUKA: late “ms” peak from low-energetic neutrons

Geant3: peak at 0.5 ms is artefact of neutron 1 MeV cut-off + capture

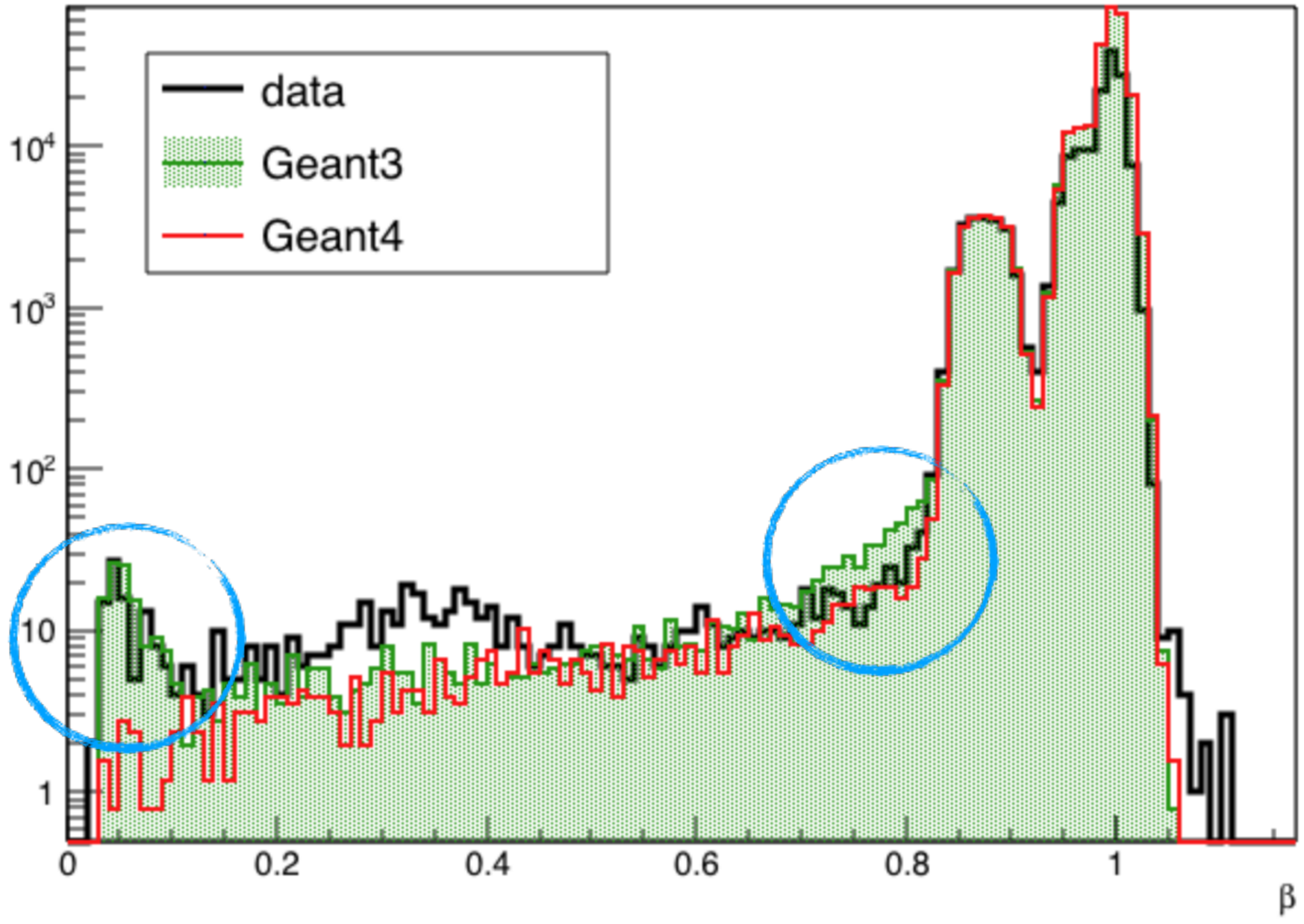
Geant4 (default): no late neutron peak

G4 with high precision physics list



Late neutron peak similar to FLUKA

Particles β distribution



- **Geant3:** better description of low-β (late) particles (by chance?)
  - not relevant for physics
- **Geant4:** better description of the high-β
  - relevant