

Geant4 and low E bump

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New Geant4 version : geant4.9.0.p01
Lots of changes in EM processes (see release notes)
+
Mokka 06-04-p03

Bug in Mokka, thanks to Paul!

- Hardcoded parameter in Ecal02:

```
theMaxStepAllowed= std::min(cell_dim_x,cell_dim_z);
```

```
G4UserLimits* pULimits = new G4UserLimits(theMaxStepAllowed);
```

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- Printout with /tracking/verbose 1: parameter rangeCut not taken into account, and this pULimits is clearly overwriting it!

- Printout: with parameters /Mokka/init/rangeCut 0.008 mm,
/Mokka/init/globalModelParameter Ecal_cells_size 0.006

Step#	X(mm)	Y(mm)	Z(mm)	KinE(MeV)	dE(MeV)	StepLeng	TrackLeng	NextVolume	ProcName
0	0	1.58e+03	0	1e+05	0	0	0	WorldPhysical	initStep
1	1.22e-15	1.6e+03	1.22e-15	1e+05	0.00802	20	20	BarrelEcalModule	Transportation
2	1.31e-07	1.6e+03	2.12e-07	1e+05	0.0538	0.2	20.2	BarrelW	Transportation
3	5.84e-06	1.6e+03	-8.47e-07	1e+05	0.461	0.219	20.4	BarrelW	muloni
8	1.19e-05	1.6e+03	-1.53e-06	1e+05	1.06	0.498	22.3	BarrelEcalModule	Transportation
9	1.67e-05	1.6e+03	1.12e-06	1e+05	0.0994	0.4	22.7	UnderPCB	Transportation
10	3.09e-05	1.6e+03	8.84e-06	1e+05	0.191	0.8	23.5	SiInsensitiveBarrel	Transportation
11	3.1e-05	1.6e+03	8.88e-06	1e+05	0.0012	0.006	23.5	SiInsensitiveBarrel	StepLimiter
90	4.15e-05	1.6e+03	8.83e-06	1e+05	0.000619	0.006	24	SiInsensitiveBarrel	StepLimiter
91	4.16e-05	1.6e+03	8.83e-06	1e+05	0.00106	0.005	24	SiBarrel	Transportation
92	4.17e-05	1.6e+03	8.84e-06	1e+05	0.00111	0.006	24	SiBarrel	StepLimiter
93	4.19e-05	1.6e+03	8.83e-06	1e+05	0.00238	0.006	24	SiBarrel	StepLimiter
94	4.19e-05	1.6e+03	8.83e-06	1e+05	9.3e-05	0.003	24	UpperPCB	Transportation
95	6.05e-05	1.6e+03	8.65e-06	1e+05	0.213	0.8	24.8	BarrelEcalModule	Transportation

Patch

- In Ecal02, just adding

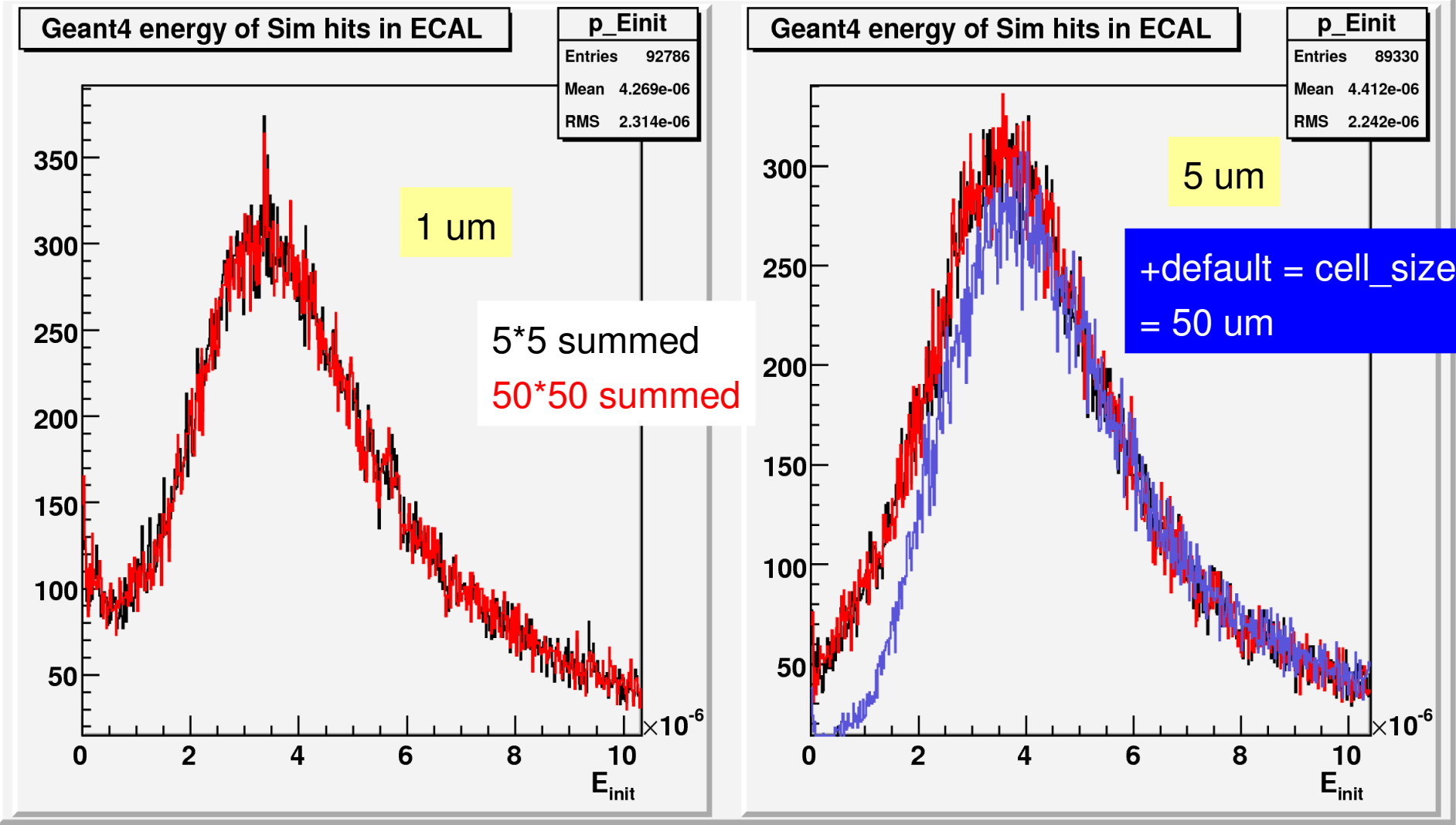
```
theMaxStepAllowed= std::min(cell_dim_x,cell_dim_z);
```

```
theMaxStepAllowed= std::min(theMaxStepAllowed,Control::ActiveRangeCut);
```

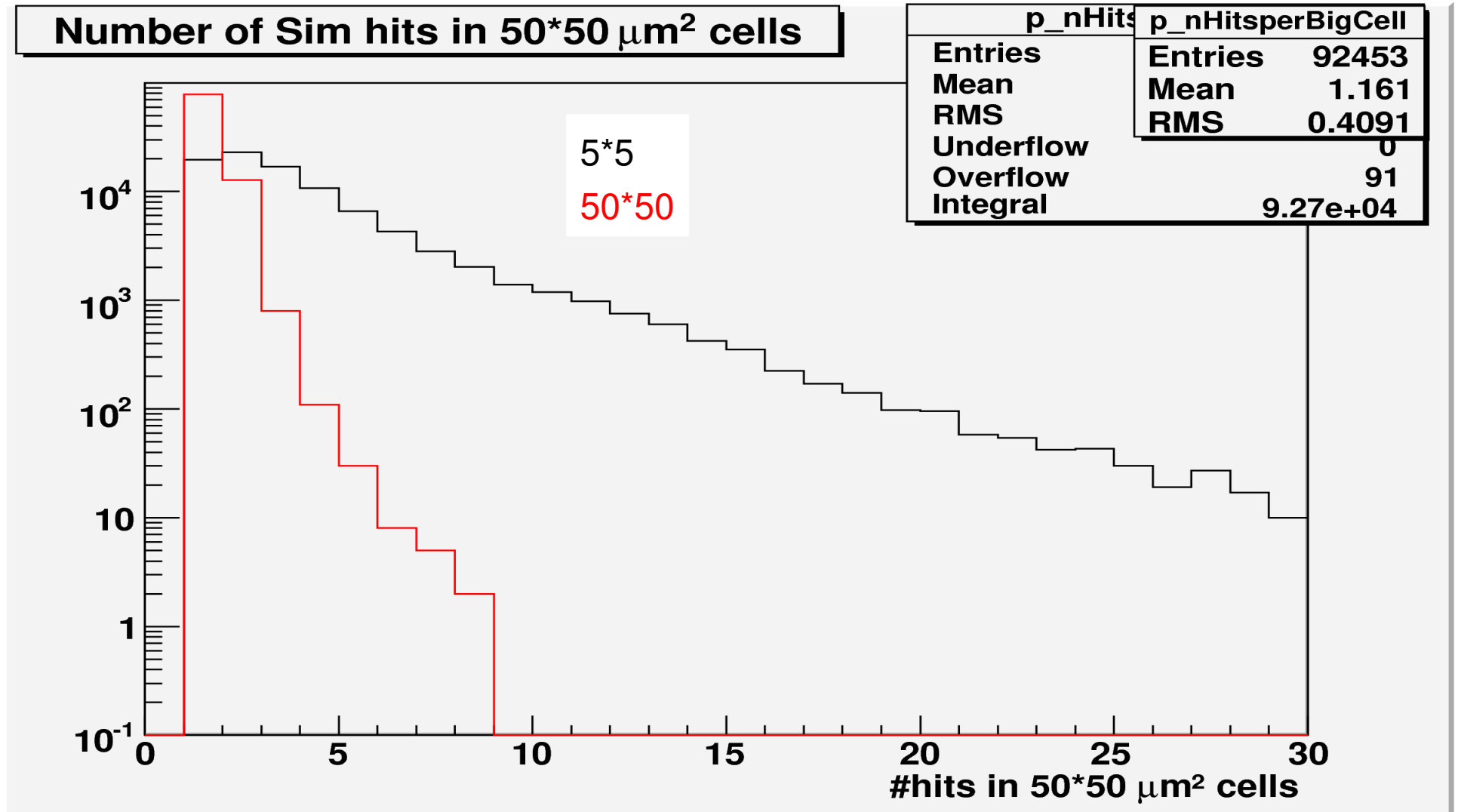
- Printout: with /Mokka/init/activeRangeCut 0.001

```
520 -0.00508 1.61e+03 -0.00871 2.14e+03 1.49e-05 0.001 2.78 SiInsensitiveBarrel StepLimiter
521 -0.00509 1.61e+03 -0.00871 2.14e+03 1.02e-05 0.001 2.78 SiInsensitiveBarrel StepLimiter
522 -0.00509 1.61e+03 -0.00872 2.14e+03 0.00322 0.000705 2.78 SiBarrel Transportation
523 -0.00509 1.61e+03 -0.00872 2.14e+03 0.000175 0.001 2.78 SiBarrel StepLimiter
524 -0.00509 1.61e+03 -0.00872 2.14e+03 0.000419 0.001 2.78 SiBarrel StepLimiter
525 -0.00509 1.61e+03 -0.00873 2.14e+03 0.000271 0.001 2.78 SiBarrel StepLimiter
```

Result on the energy distribution, 10 GeV photons, 100 events

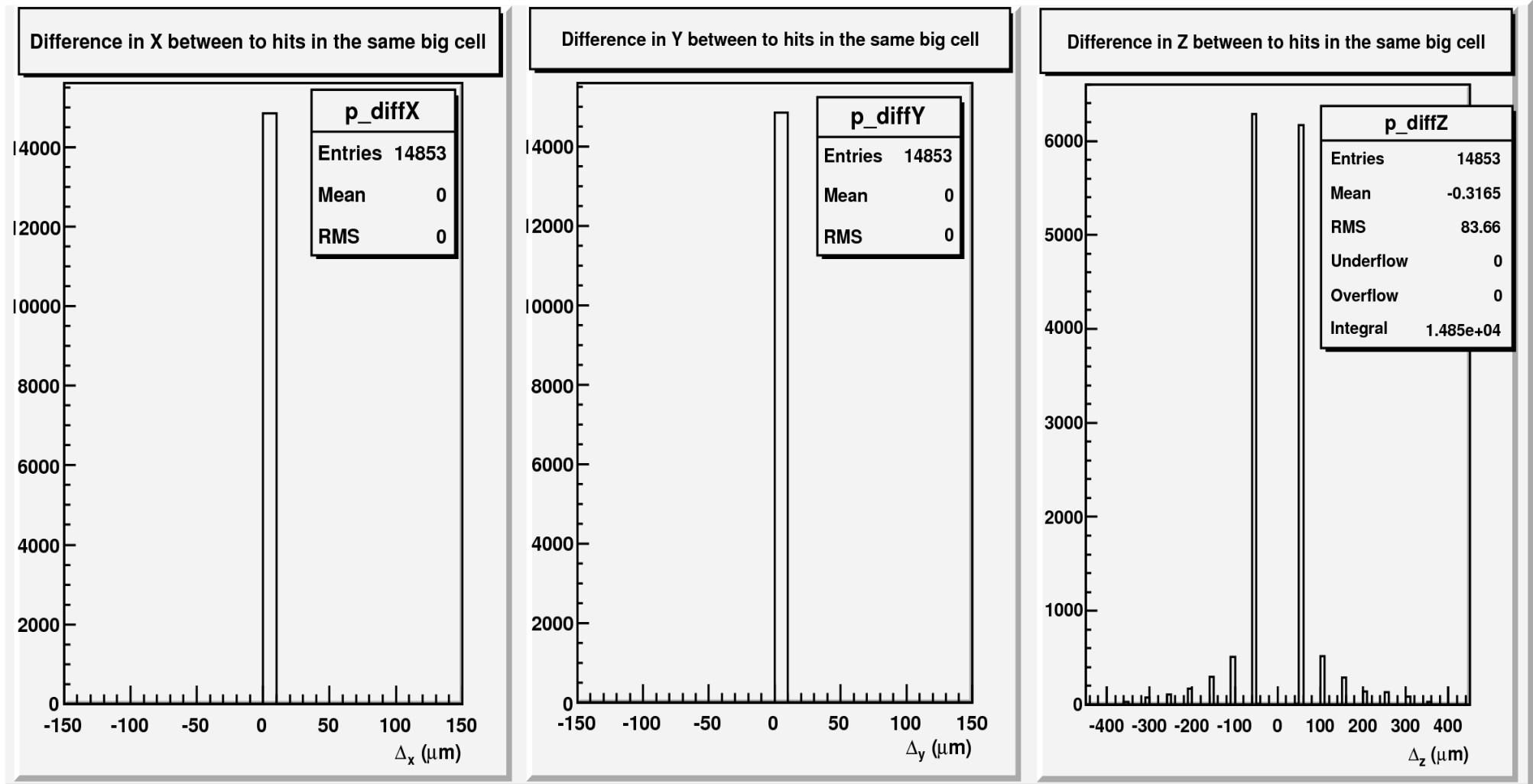


Multiple hits per pixel ?????



What's going on ??

- Not the same position: 50 μm , and always in z... So the J index is the same (endcap disabled...), but the cell is clearly not !?!!???



nMCcontributions

