Subject: Some benchmarks...
Posted by Johan Messchendorp on Thu, 05 Feb 2009 00:00:39 GMT
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Dear all,

During our last meeting, a question was raised about the data sizes presently within our framework. I looked at this.... here the outcome:

Conditions:

* DPM, 10 GeV/c, 100 events
* Transport model: Geant4, default cuts
* No visualization tracks stored!
* Linux kvip81.kvi.nl 2.6.9-1.667smp #1 SMP Tue Nov 2 14:59:52 EST 2004 i686 i686 i386 GNU/Linux, 3 GHz, 6000 bogomips (not really the fastest computer on the market!!)
* Macros: pandaroot/macro/run/[sim][digi][reco]_complete.C

Points, MCTracks, TGeo stuff

* EMC+MVD+STT+TOF+MDT+DCH
-> filesize: 27 MBytes (MCTrack+TGeo: 13 Mbytes, EMC: 12 MBytes, etc.)
-> computation time: 740 secs (570 seconds in case all passive detectors)
-> TGeo contribution: 2.1 MBytes

Digitalization

* EMC+MVD+STT+TOF+MDT+DCH
-> filesize of all digi's: 1.1 MBytes (STT: 463 kBytes, EMC: 246 kBytes, DCH: 230 kBytes, MDT:141 kBytes, etc.)
-> computation time: 64 secs (EMC: 59 secs, STT: 3.7 secs, etc.)

Reconstruction

* EMC+MVD+STT+DCH
* MVD: only clustering
* DCH: track finding and matching (no fitting!)
* STT: track finding and matching and helix fitting
* EMC: clustering and bump finding
-> filesize: 1.0 MBytes (EMC: 555 kBytes, STT: 400 kBytes, etc.)
-> computation time: 180 secs (EMC: 167 secs, STT: 20 secs, etc.)

Momentum dependence

In the graph, the momentum dependence on the filesizes for 100 DPM events are depicted; black=points+MCTrack+TGeo, blue=digis, red=recos. Note the logarithmic y-axis!

Few conclusions:

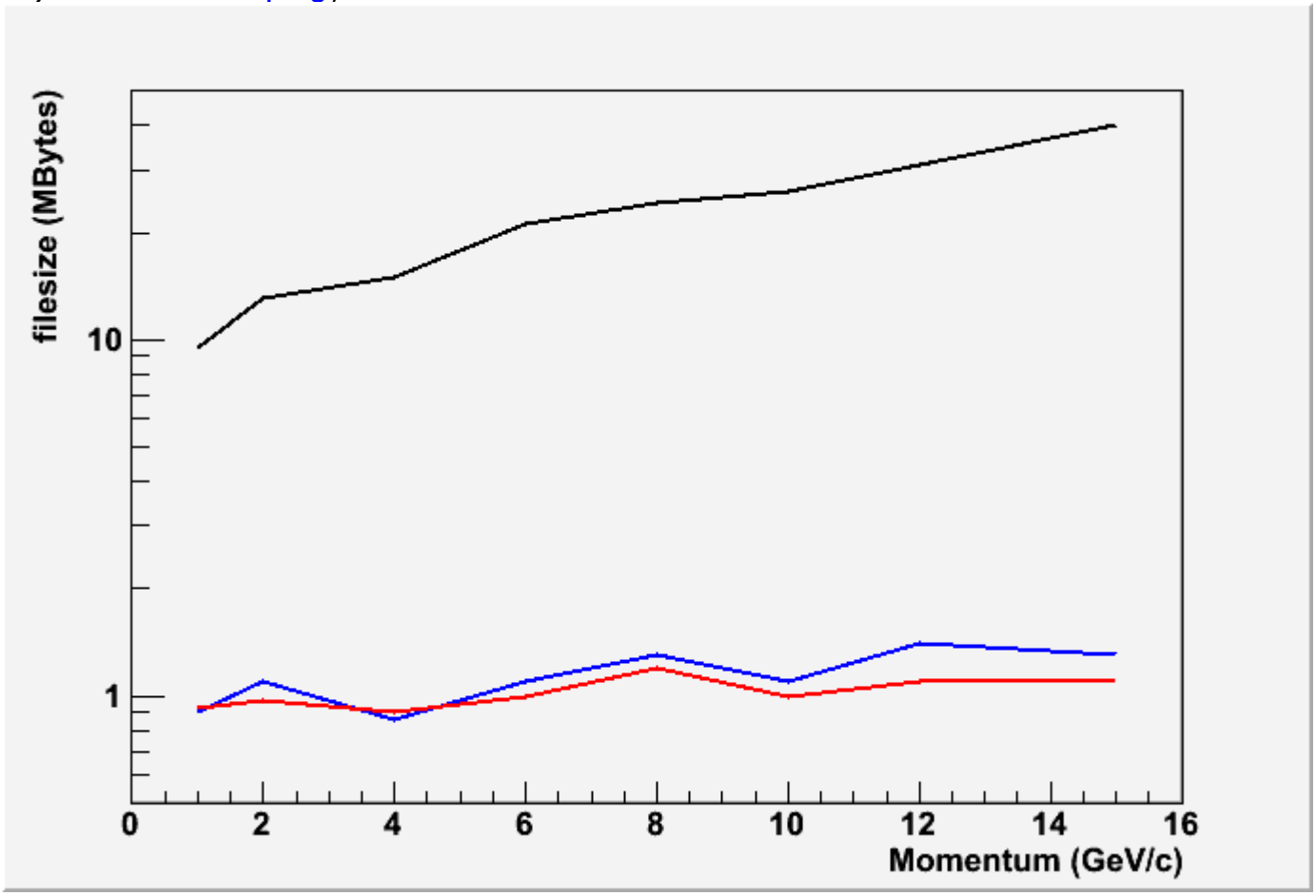
1) Points and MCTracks are very expensive in filesize. Q: which information do we want to

keep of this???
2) computation time predominantly from the transport (note that this is not optimized yet for Geant4 with respect to cuts etc.)
3) EMC/STT are the most expensive detectors with respect to filesize on the level of digitization and reconstruction. Computation-wise, the EMC is THE bottleneck.
4) The filesize of digis and recos hardly change as a function of incident beam momentum for the DPM generator.
5) the digi sizes are very large, if we want to store 10^12 evts (~10 PBytes)

Johan.

File Attachments

1) filesize.png, downloaded 1478 times



Subject: Re: Some benchmarks...
Posted by Mohammad Al-Turany on Thu, 19 Feb 2009 12:34:24 GMT
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Hallo Johan,

I repeated your test but only for simulation to see what the filtering is doing! the result is the total file size for simulation has been reduced to 20 MBytes just by skipping particles that do not hit any thing!