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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 file sizes 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 866 times

