Subject: Recent status of time-based simulation
Posted by Jifeng Hu on Mon, 25 Mar 2013 17:54:57 GMT
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Dear All,
After considering all aspects, my time-based simulation
is designed at this stage as follows:

a) The event time is sampled by f(t)=1/T exp(-t/T), default in PandaROOT.
please see figure time_gap.png.

b) The pileup effect is simulated at producing waveform stage,
not eariler (hitting) or later (digitization).
here waveforms are formulated using dima's implementation.
The pulseshape implementation of such waveforms is the inputed shapes of FPGA according to Myroslav's opinion (see also the published paper: feature extraction algorithm), so I didn't make any changes.

c) The feature extraction algorithm in my simulation is adopted as fitting waveforms, to make the results of time-based simulation clear, rather than the algorithm published, as I discussed to Myroslav. Because for some pileup waveforms with only one peak and piled up more than 2 times, the simple peak finder doesn't work, however, such waveforms have a very smaller percent, next time, I will show the numbers.
please see figures in attachment Comb1-6.eps, you will see
differenct cases, including failed fitting.

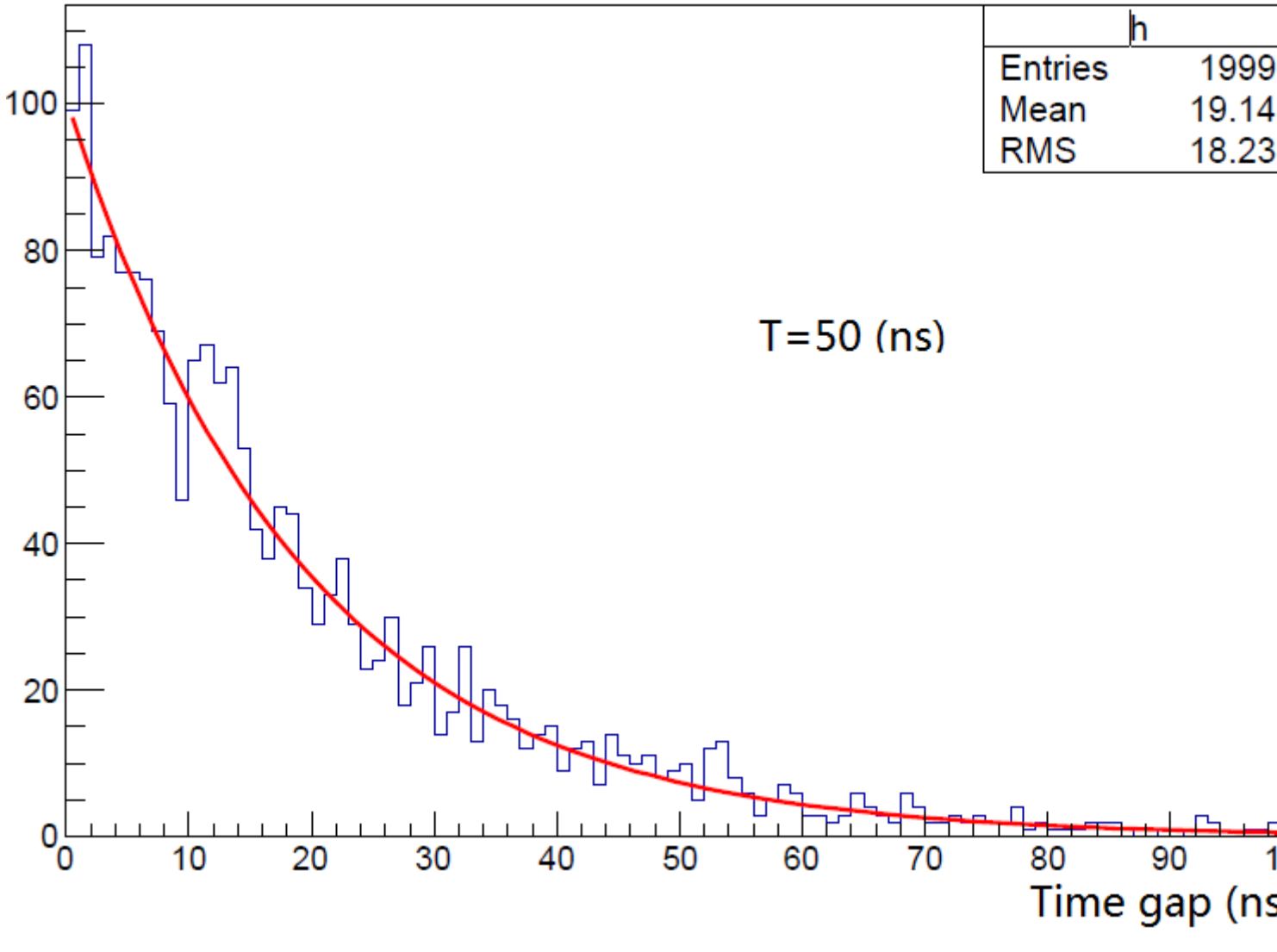
d) To get preliminary results, I haven't developed a new time-based reconstruction algorithm yet, but reuse the existed algorithms. To do this, digis are restored to an event according to their time-stamp, and reorganized to event structure in order to perform physics analysis, such as to get photon detection efficiency, etc..
This algorithm is in some part simple.
see my talk in DPG meeting, section HK68.6

e) With current simulaton, we can get the probablity of pileup waveforms, probability of pileup events, photon detection efficicency etc. function as event rate, also
photon detection efficiency function as polar angle, azimuth for energy 1GeV photons, I will post pictures once local sever works.

let me know your opinions.
best regards,
Jifeng Hu

File Attachments

1) time_gap.png, downloaded 887 times



2) Comb.eps, downloaded 554 times