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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 earlier (hitting) or later (digitization).  
here waveforms are formulated using dima's implementation.  
The pulshape implementation of such waveforms is the inputted 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 different 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 simulator, we can get the probability of pileup waveforms, probability of pileup events, photon detection efficiency etc. function as event rate, also photon detection efficiency function as polar angle, azimuth for energy 1GeV photons, I will post pictures once local server works.

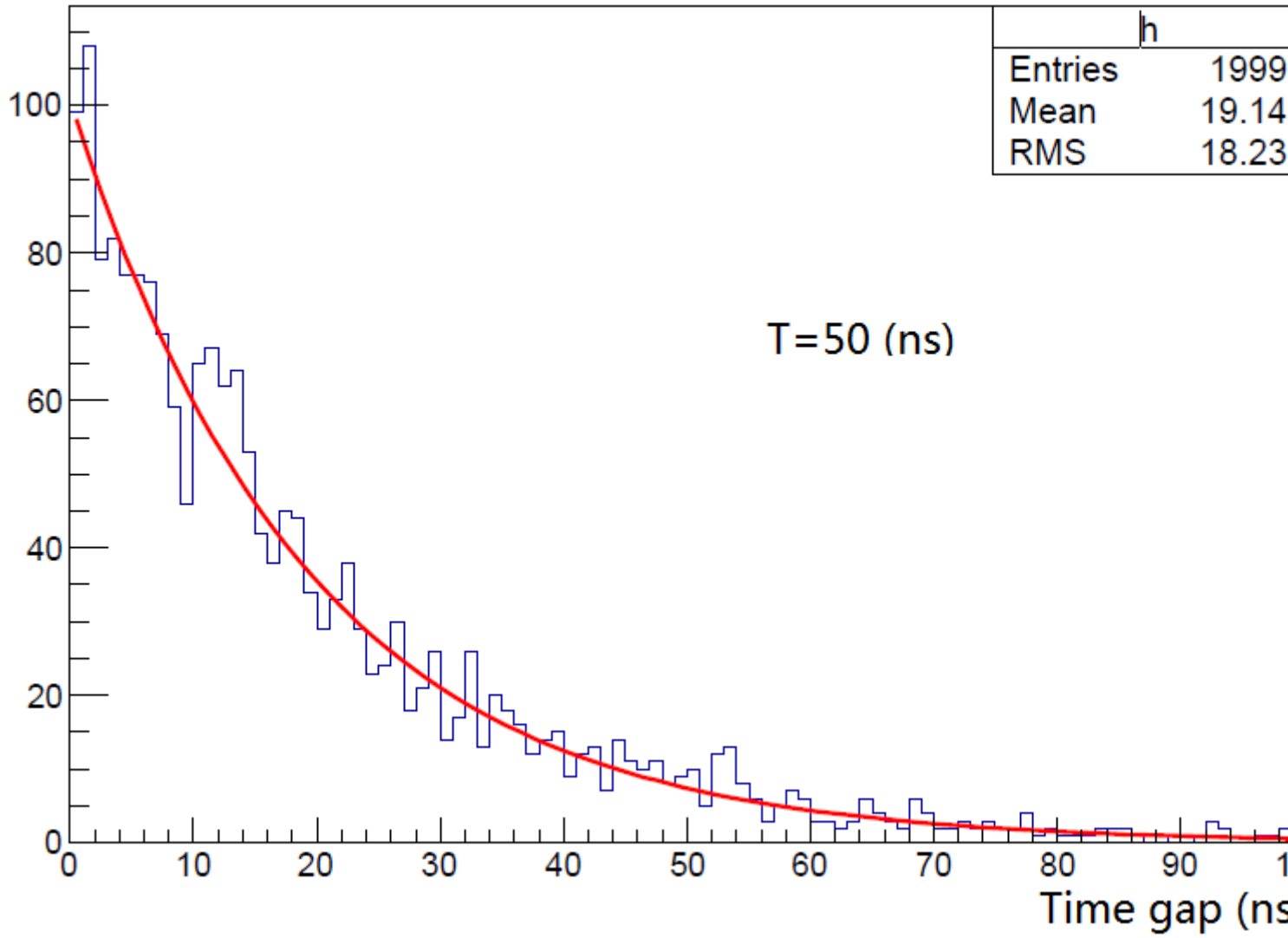
let me know your opinions.

best regards,  
Jifeng Hu

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### File Attachments

1) [time\\_gap.png](#), downloaded 998 times



2) [Comb.eps](#), downloaded 585 times