Subject: Deviation in multi-neutron simulations
Posted by C. A. Douma on Tue, 24 May 2016 12:56:51 GMT
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Dear Mr. Kresan,

I am trying to reproduce your results on multi-neutron simulations from your page https://www.r3broot.gsi.de/multi-neutron-simulation

I follow the steps indicated by r3blandsim.C and precalibr.C: First I run Monte Carlo simulations for 1-5 neutrons on 600 MeV per particle (I used r3ball.C)
I fire the particles from the origin with a box generator with Ptot = 600 MeV + rest energy (consistent with relativity), theta = 0 - 80 mrad, phi = 0-360 deg.
I only have NeuLAND at 13 m from the origin and no other detectors in the cave. Then I run the digitizer, cluster finder and R3B pre-calibrator as indicated by precalibr.C
(I use calibr_mini.C to compute the cuts).

However, my histograms do not look at all like your histograms. I do not mean the efficiencies and the cuts, I mean the shape and color of the blobs themselves.
Initially I thought the difference was due to the use of land/neuland digitizer, so then I decided to test both of them (50000 events), but the histograms are
nearly identical (land digitizer is just a lot slower).

What I find even more strange is that the picture of your histograms on
https://www.r3broot.gsi.de/multi-neutron-simulation
also does not look like the histograms on page 56 of the NeuLAND technical design report.
And the pictures on Jan Mayer his talk of March 1st (slide 7) look again
different. I do not mean the cuts, efficiencies or even the amount of red in the blobs (this just depends on how much you zoom in the z-cirection). I mean the x and y location of the blob center and the relative pattern of the colors and of the dispersion of the hits. This is somewhat different in all distinct cases.

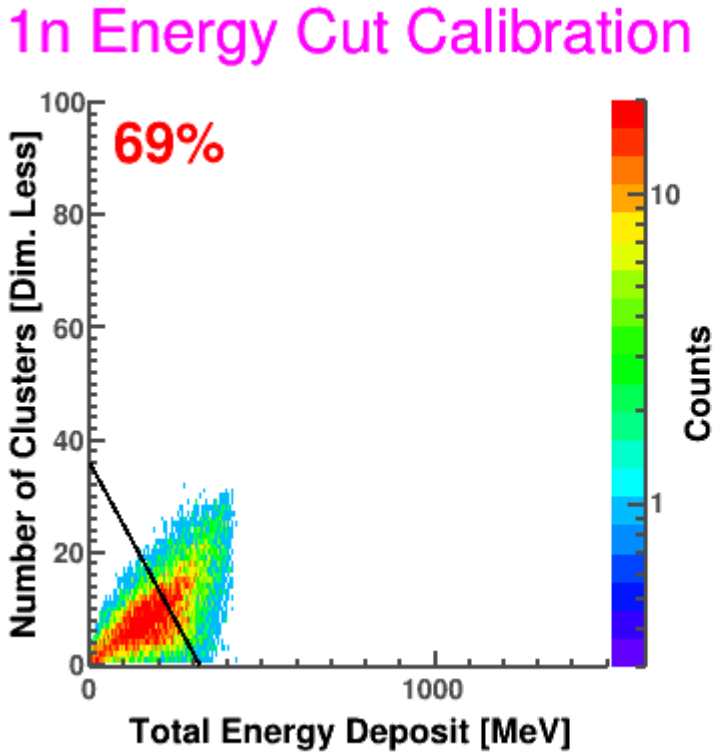
Can you explain the nature and reasons for these differences to me? And maybe help me to improve my histograms?

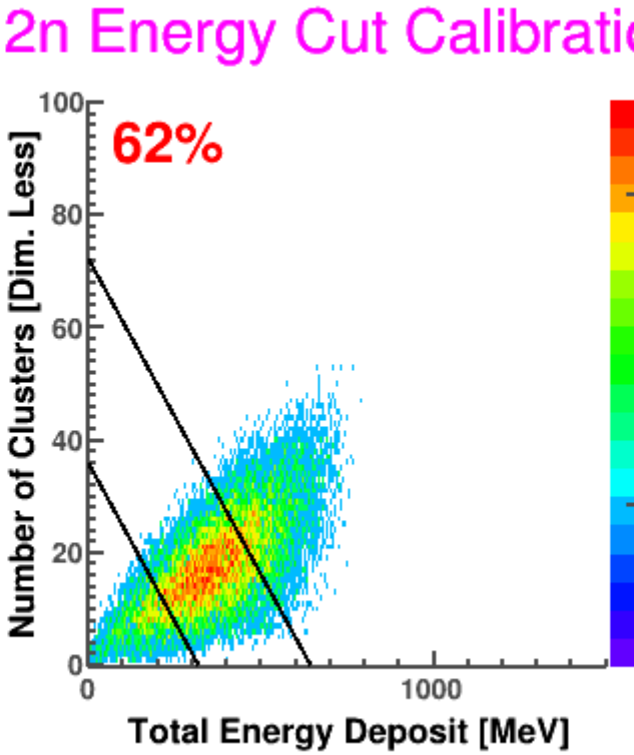
Yours sincerely,
Christiaan Douma.

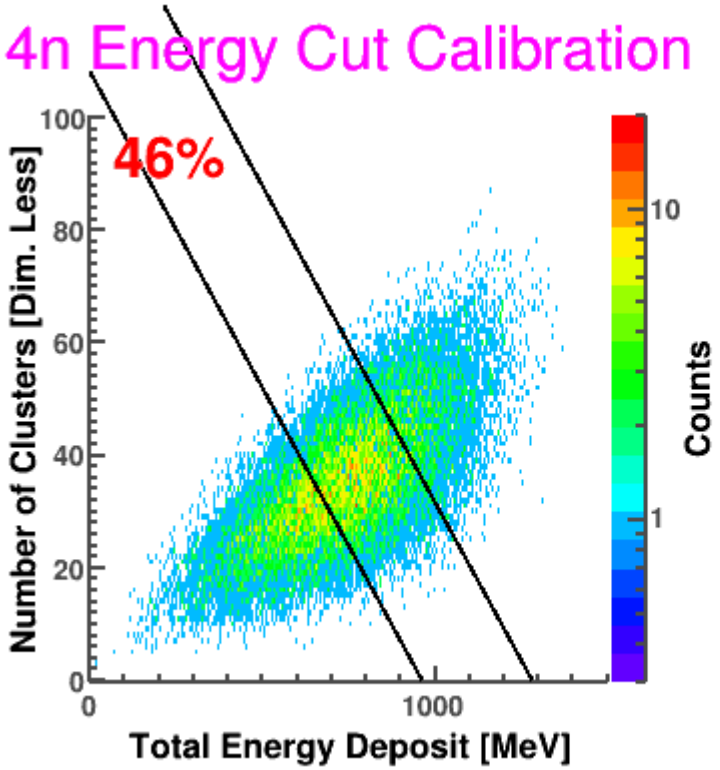
PS: The LAND_Digitizer.png picture I will upload in a response since I can only upload one picture at a time.

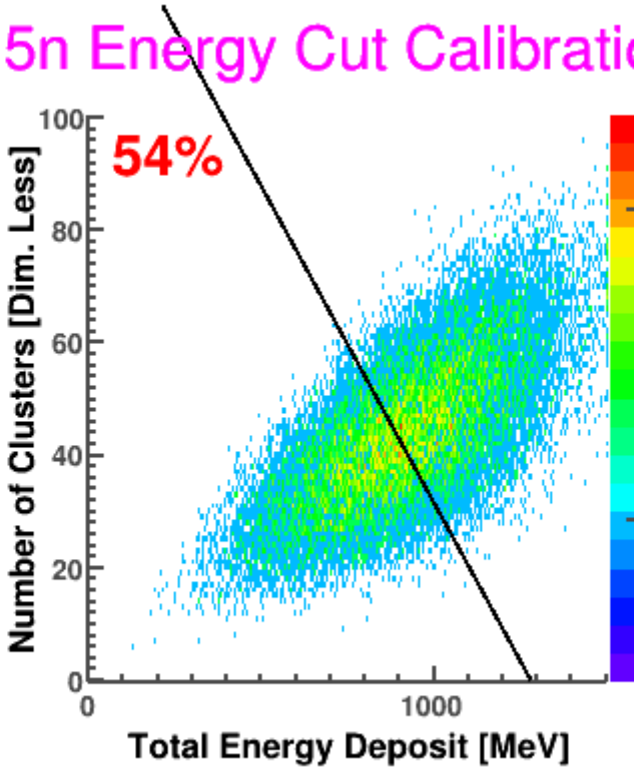
File Attachments

1) NeuLAND_Digitizer.png, downloaded 1226 times


1n Energy Cut Calibration
69%
Number of Clusters [Dim. Less]
Total Energy Deposit [MeV]
Counts
0
20
40
60
80
100
1000
1
10


2n Energy Cut Calibrati
62%
Number of Clusters [Dim. Less]
Total Energy Deposit [MeV]
0
20
40
60
80
100
1000


4n Energy Cut Calibration
46%
Number of Clusters [Dim. Less]
Total Energy Deposit [MeV]
Counts
0
20
40
60
80
100
1000
1
10


5n Energy Cut Calibrati
54%
Number of Clusters [Dim. Less]
Total Energy Deposit [MeV]
0
20
40
60
80
100
1000