

Cross-talk Studies

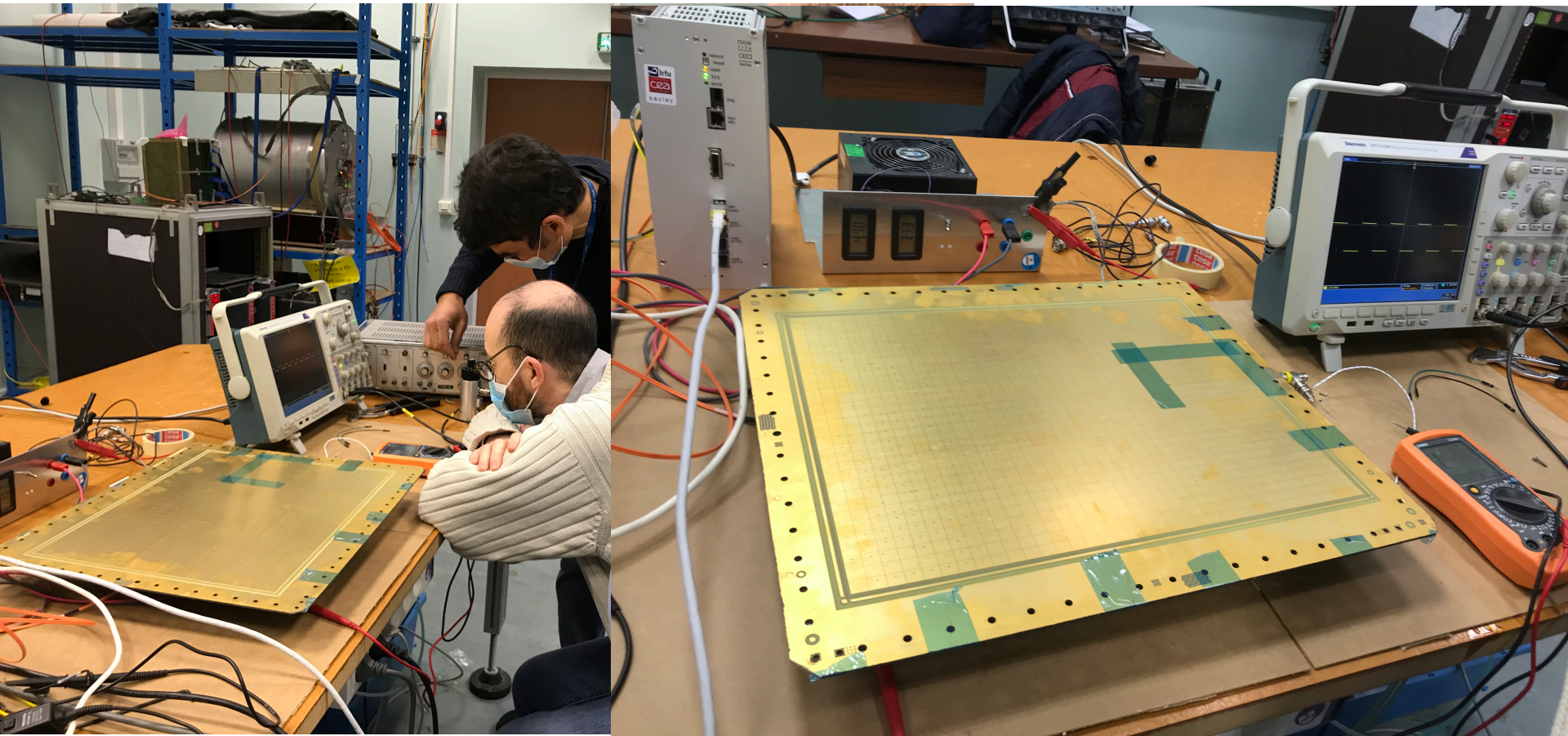
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CEA-Saclay, IRFU-DPhP-DEDIP-DIS

January 14th, 2021



Setup

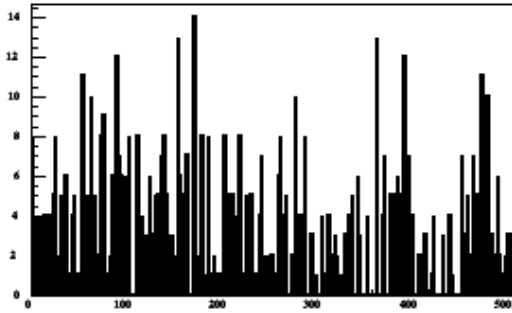


Setup

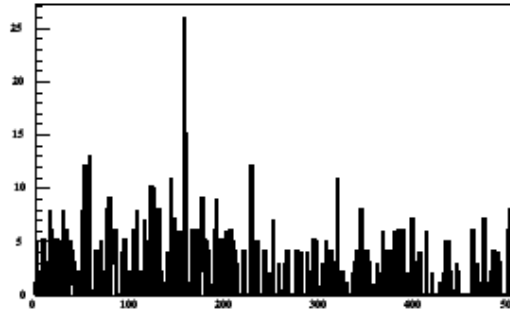
- The tested detector doesn't have a resistive layer
- We have injected a signal of $U = 19 \text{ mV}$ and used a capacitance of $C = 4.7 \text{ pF}$
- In this case, we have a charge $Q = CU = 89,3 \text{ fC}$
- Knowing that for our electronic
 - $120 \text{ fC} \rightarrow 4096 \text{ ADC (max)}$
 - $89.3 \text{ fC} \rightarrow 3048 \text{ ADC (expected)}$
- We have injected 180 pads.
- We are working on improving the setup and will take new data next week.

Example of Injected Signal (1 event)

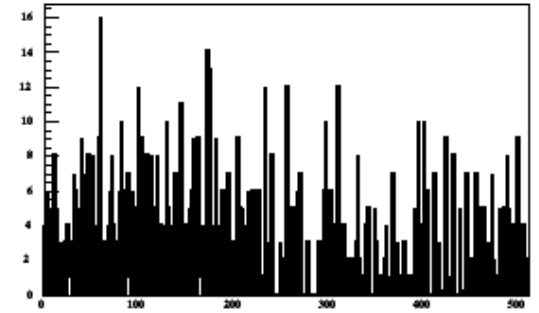
h_waveforms_l_26_l_16



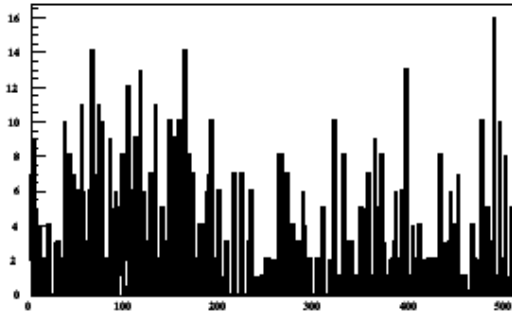
h_waveforms_l_27_l_16



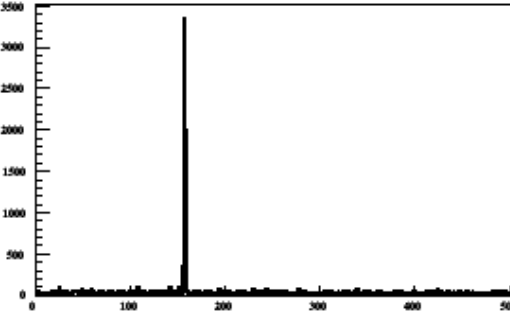
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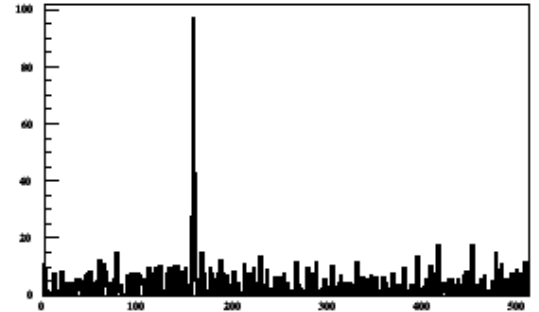
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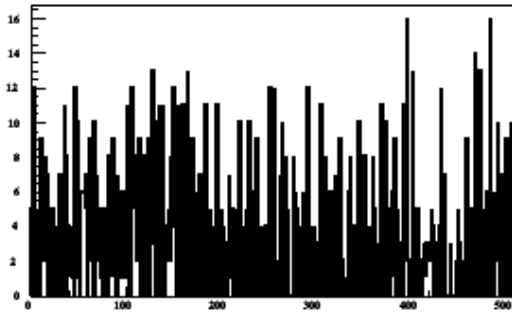
h_waveforms_l_27_l_15



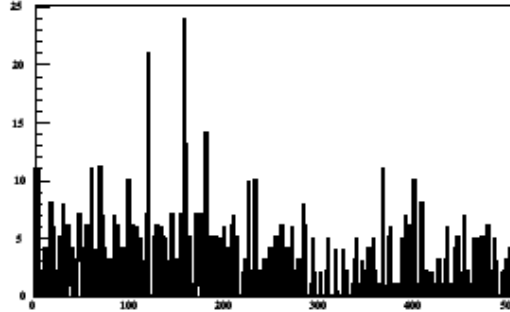
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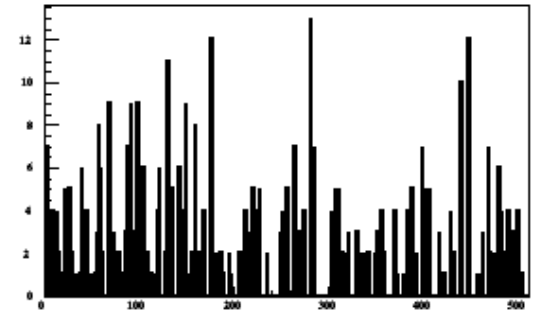
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h_waveforms_l_27_l_14

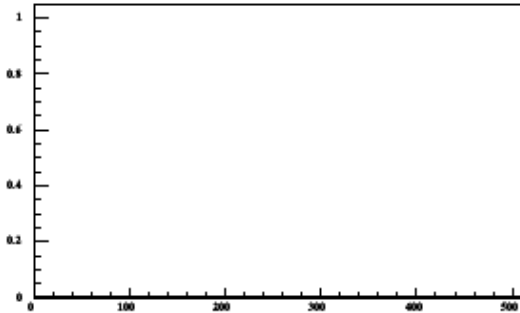


h_waveforms_l_28_l_14

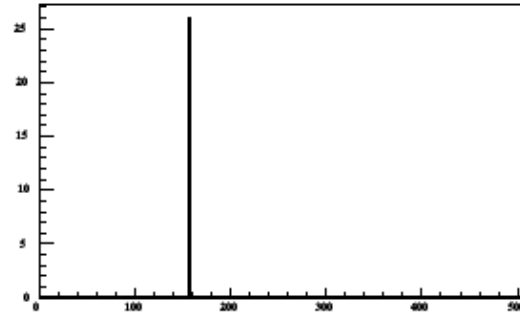


Injected Signal : selecting events with charge >22.5

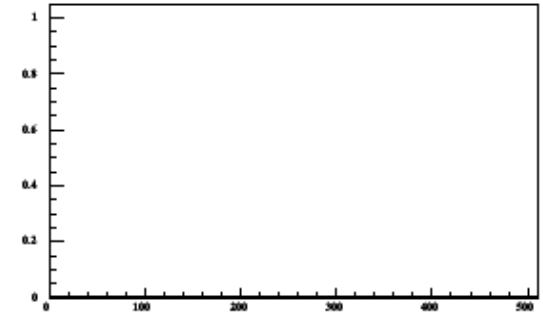
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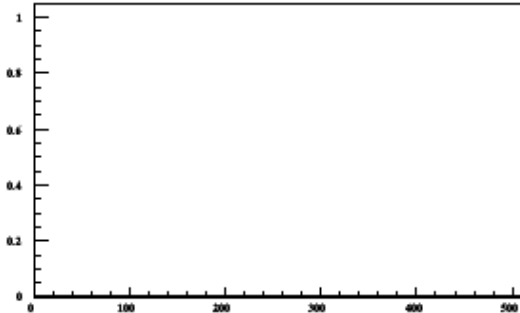
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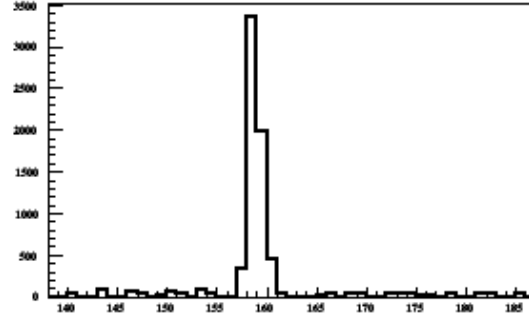
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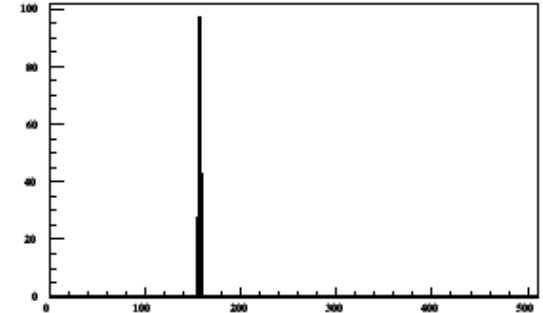
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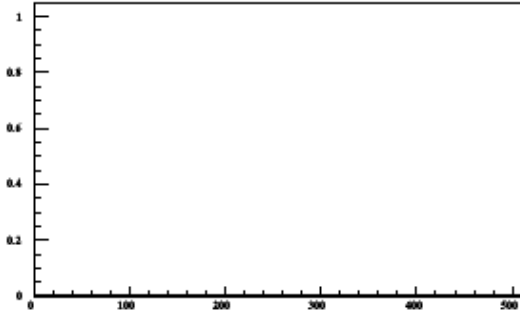
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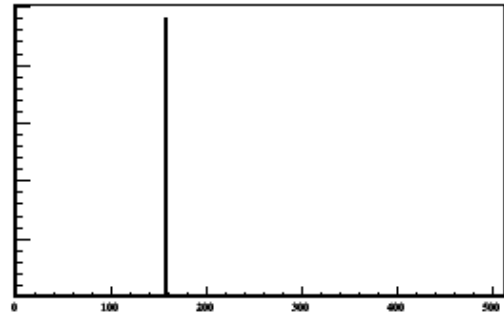
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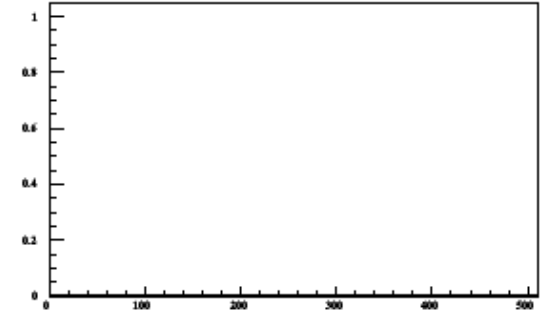
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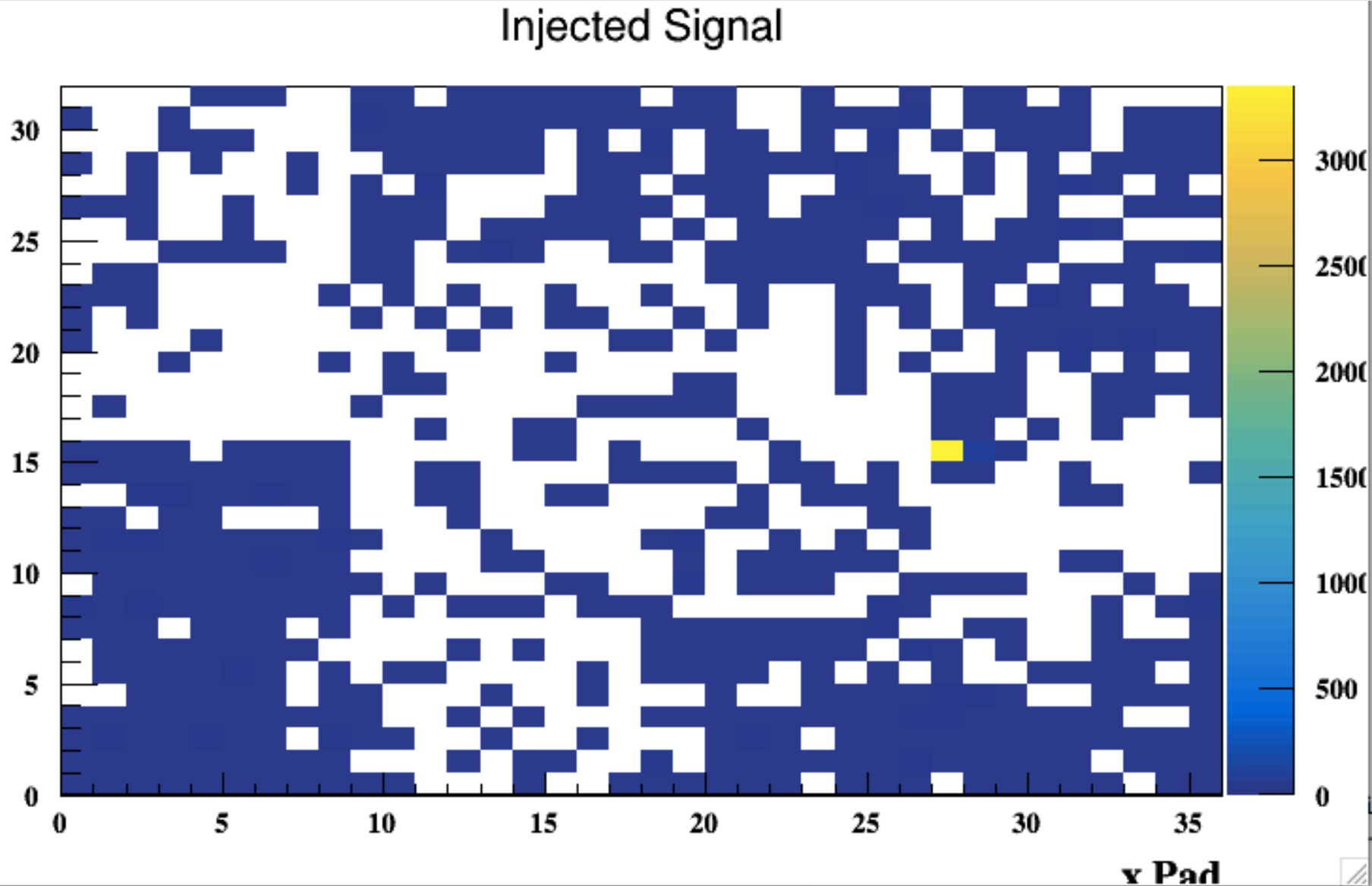
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h_waveforms_i_28_i_14

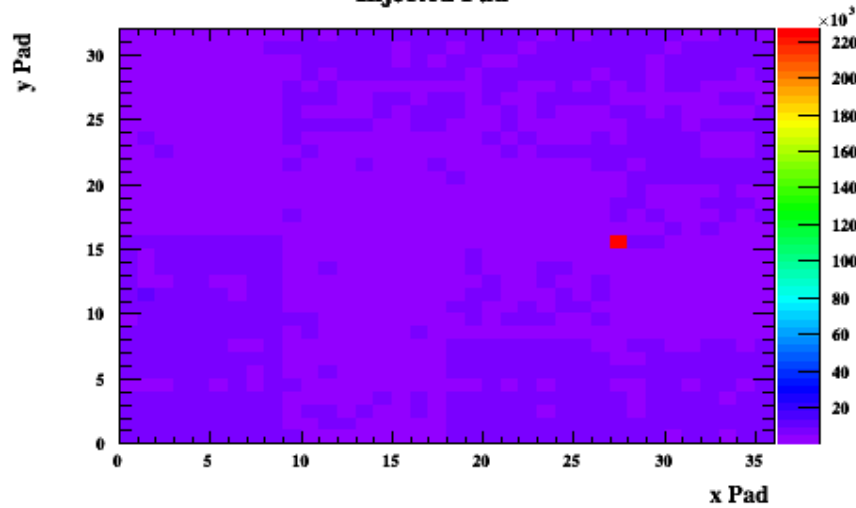


Injected Signal : selecting events with charge >22.5

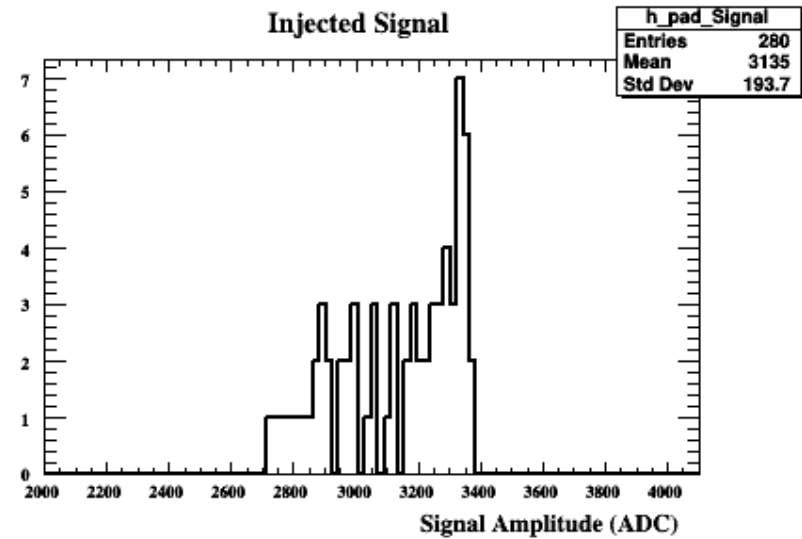


Cross-talk map

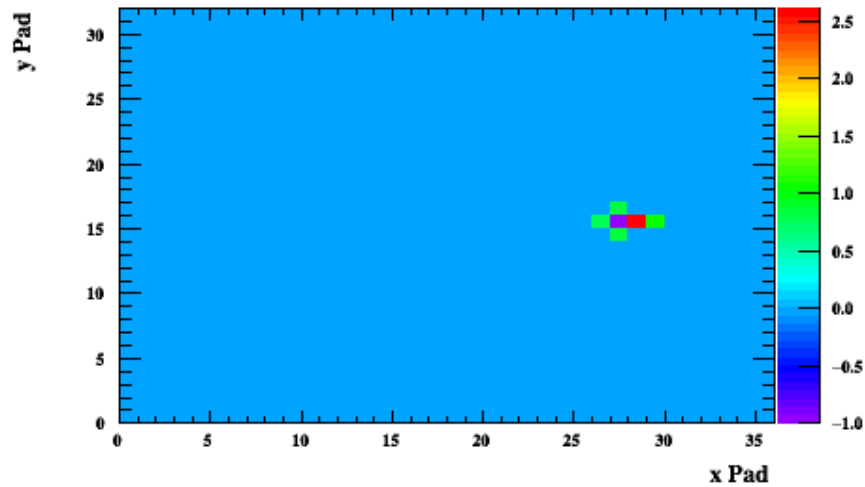
Injected Pad



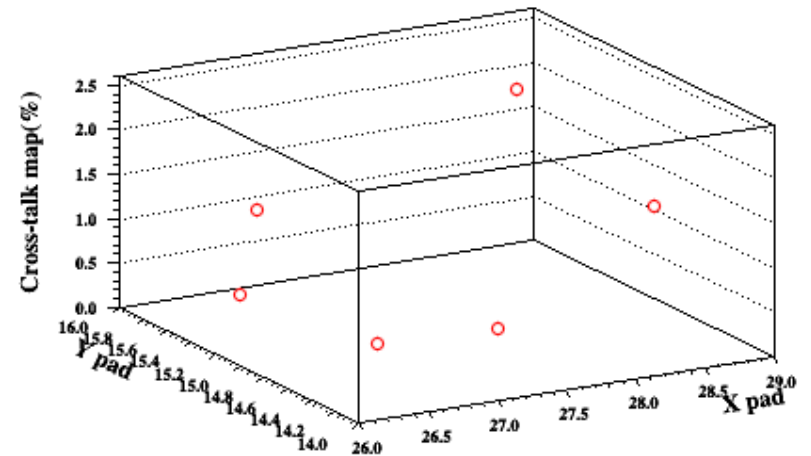
Injected Signal



Cross-talk map(%)

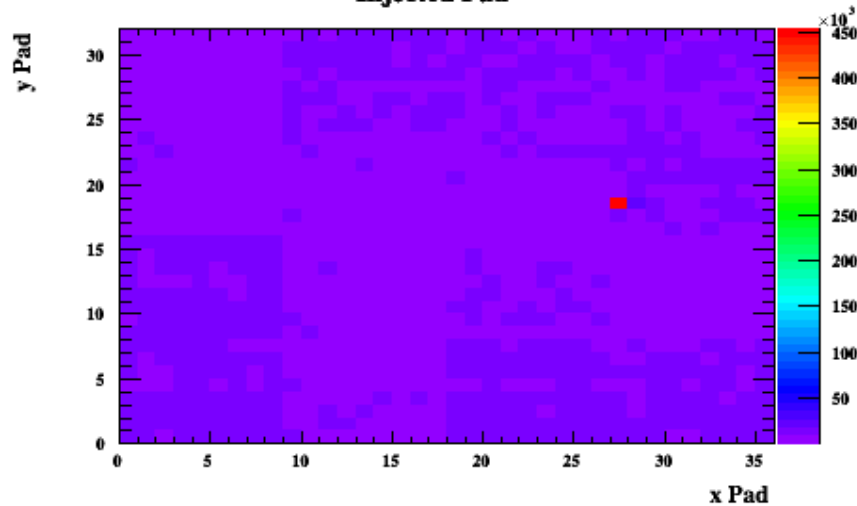


Cross-talk map

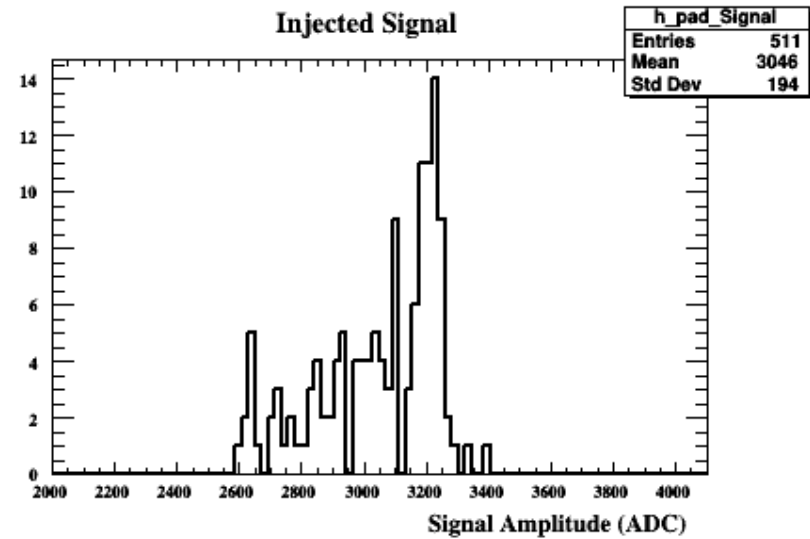


Cross-talk map

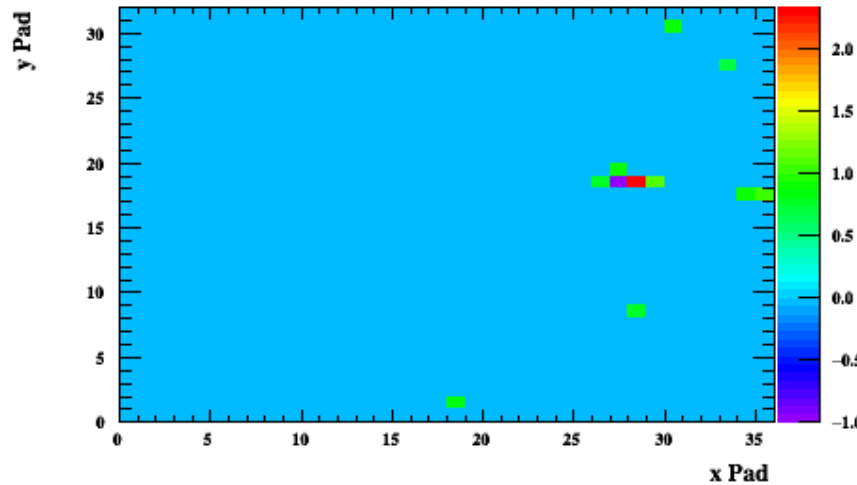
Injected Pad



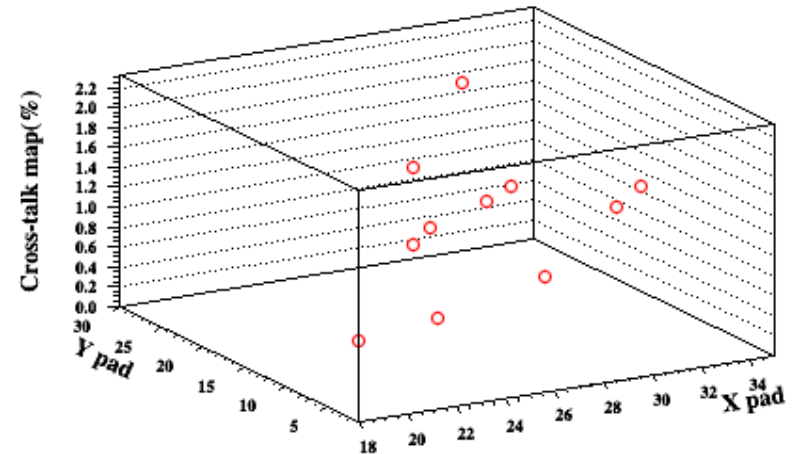
Injected Signal



Cross-talk map(%)

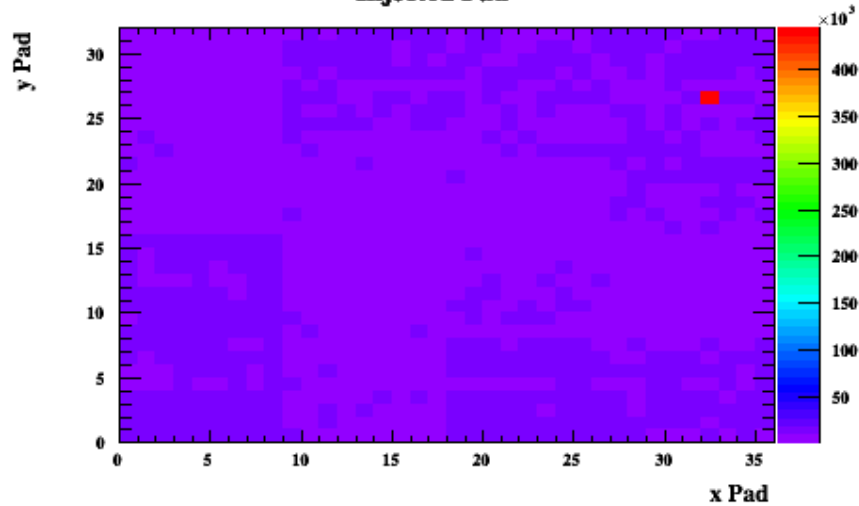


Cross-talk map

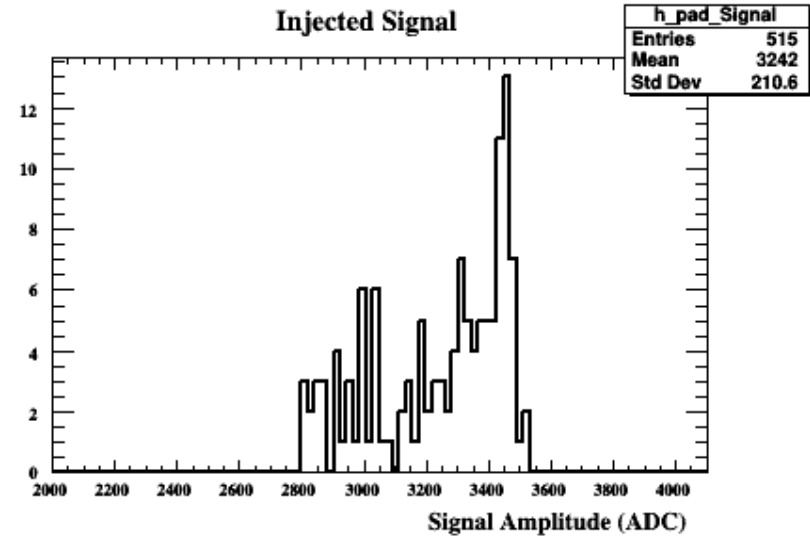


Cross-talk map

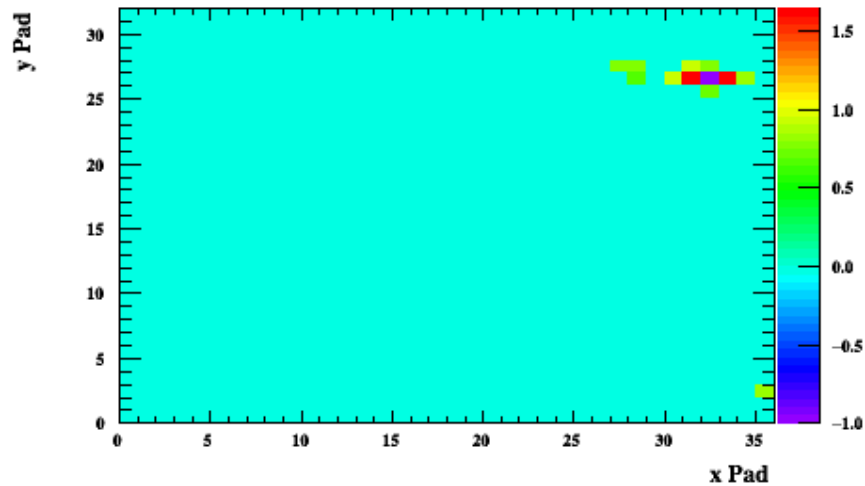
Injected Pad



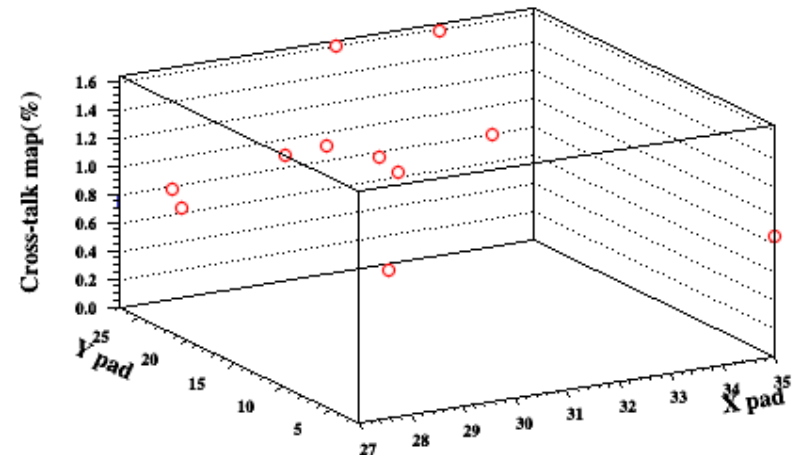
Injected Signal



Cross-talk map(%)

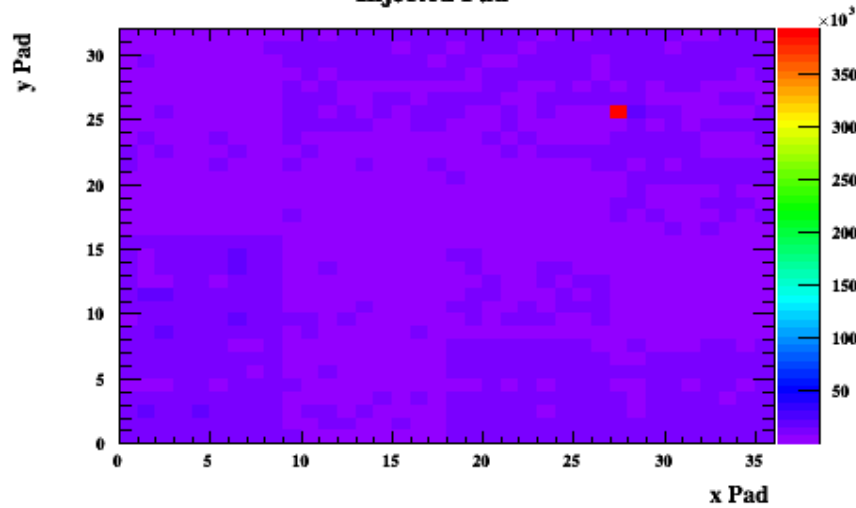


Cross-talk map

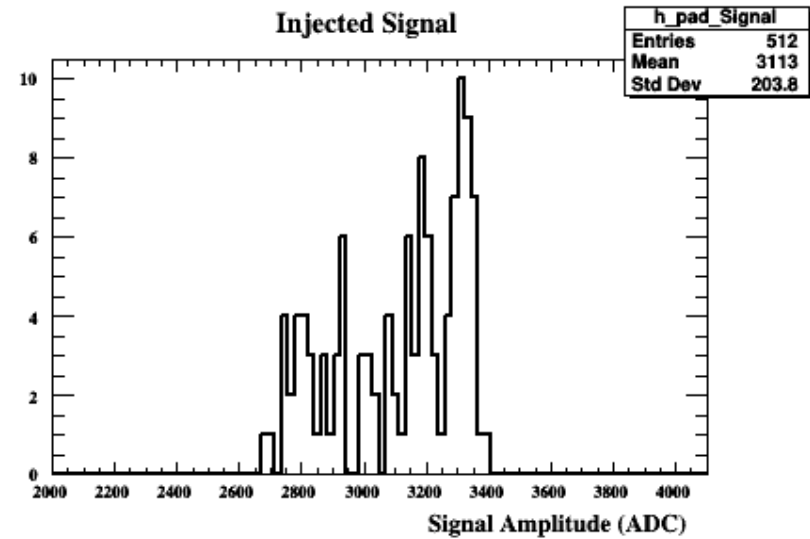


Cross-talk map

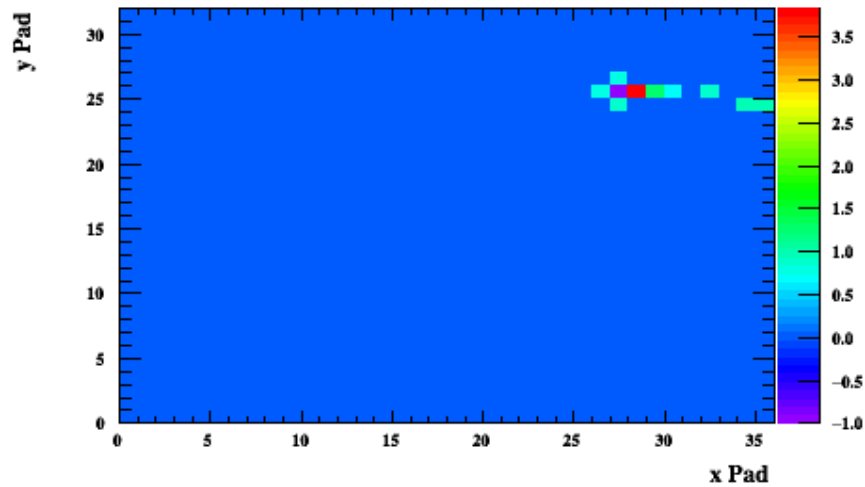
Injected Pad



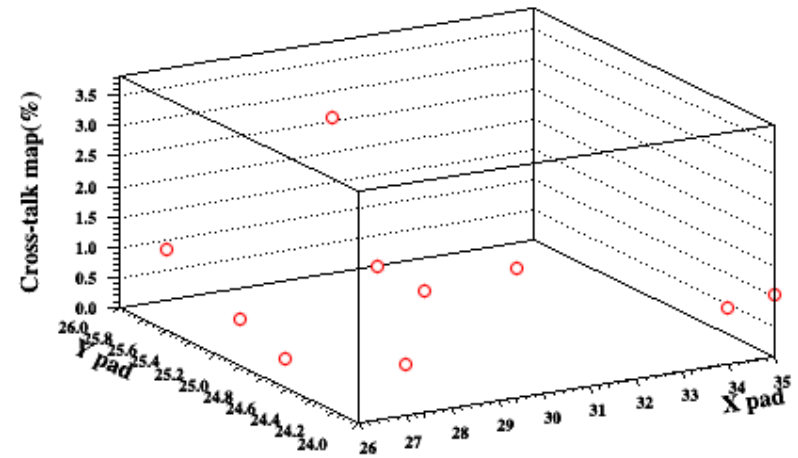
Injected Signal



Cross-talk map(%)

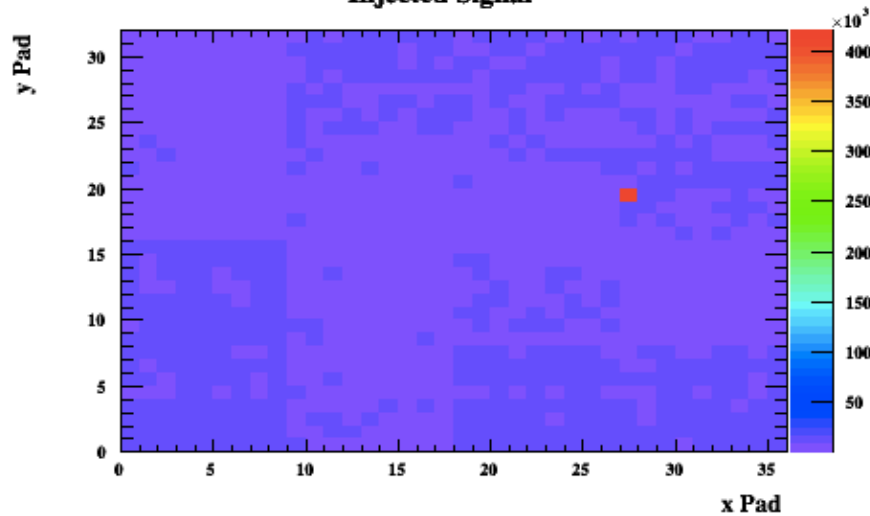


Cross-talk map

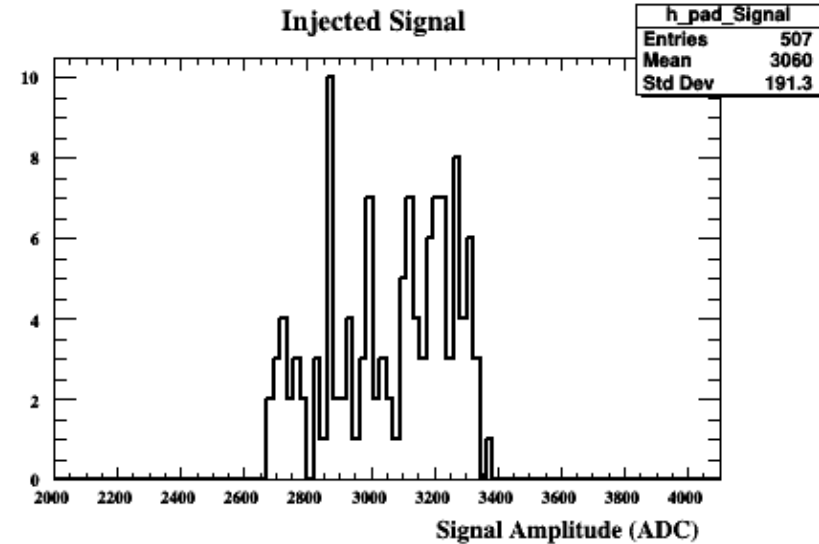


Cross-talk map

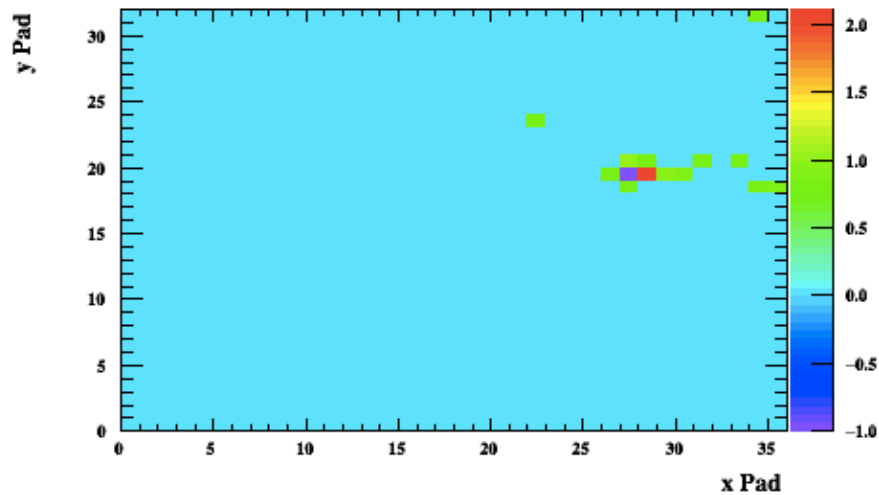
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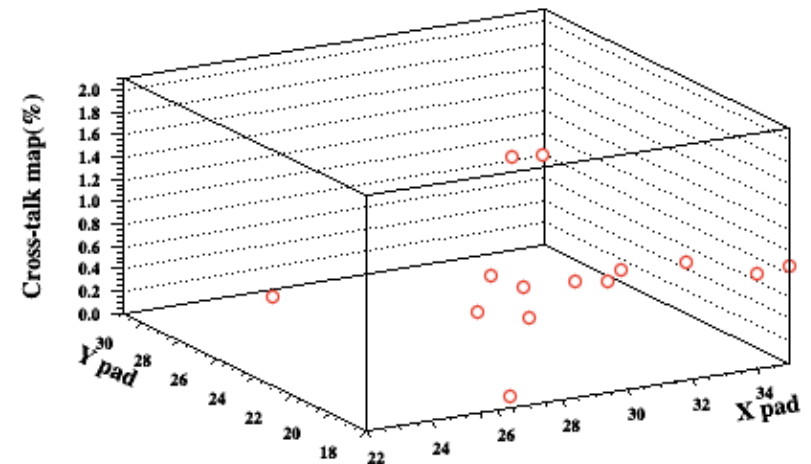
Injected Signal



Cross-talk map(%)

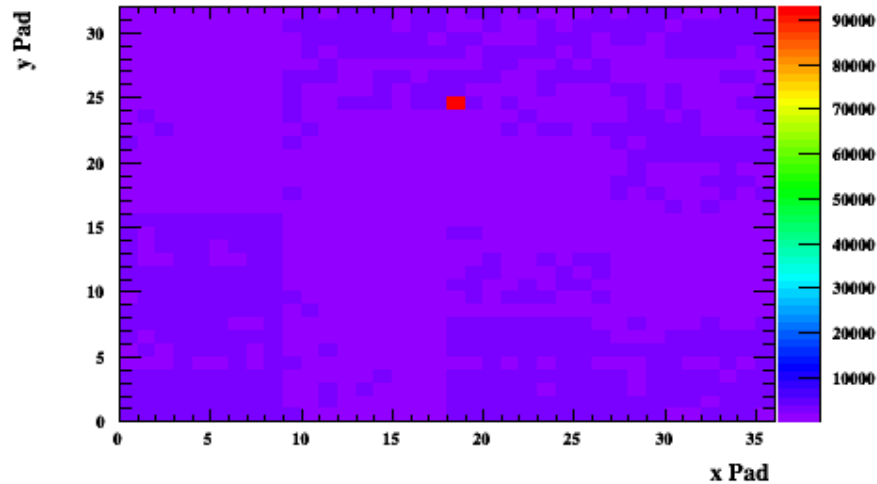


Cross-talk map

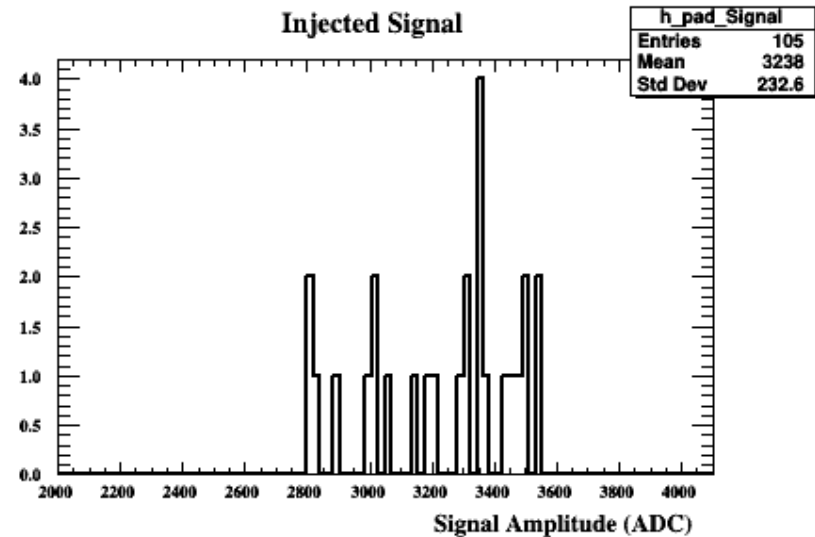


Cross-talk map

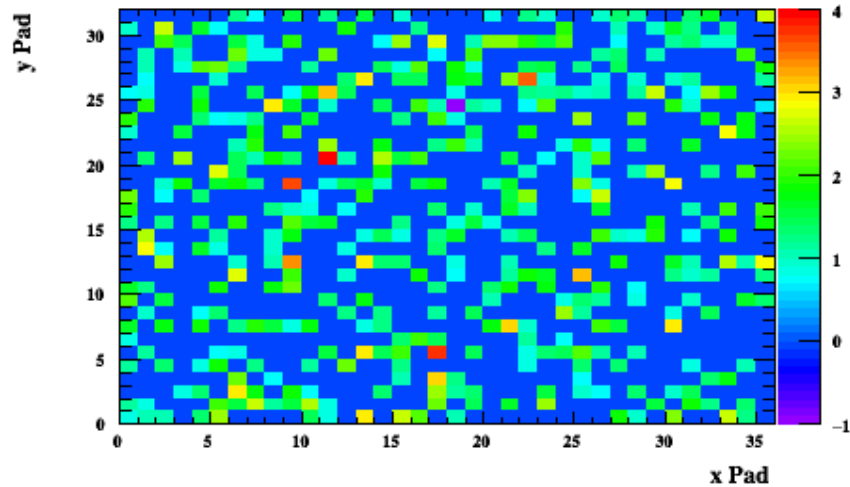
Injected Pad



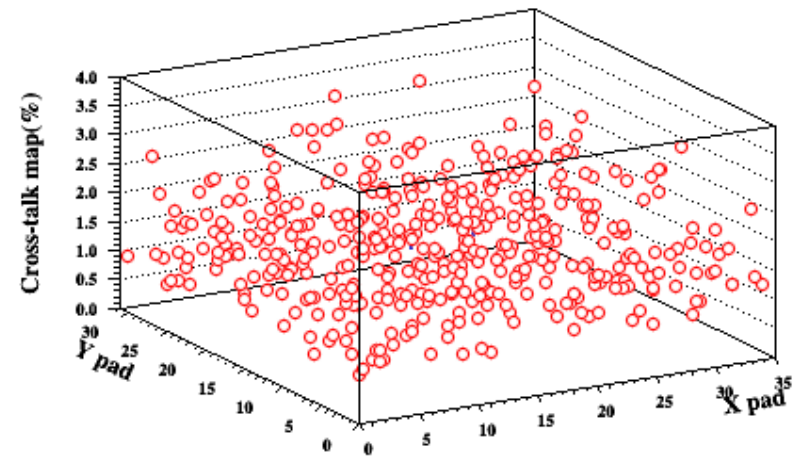
Injected Signal



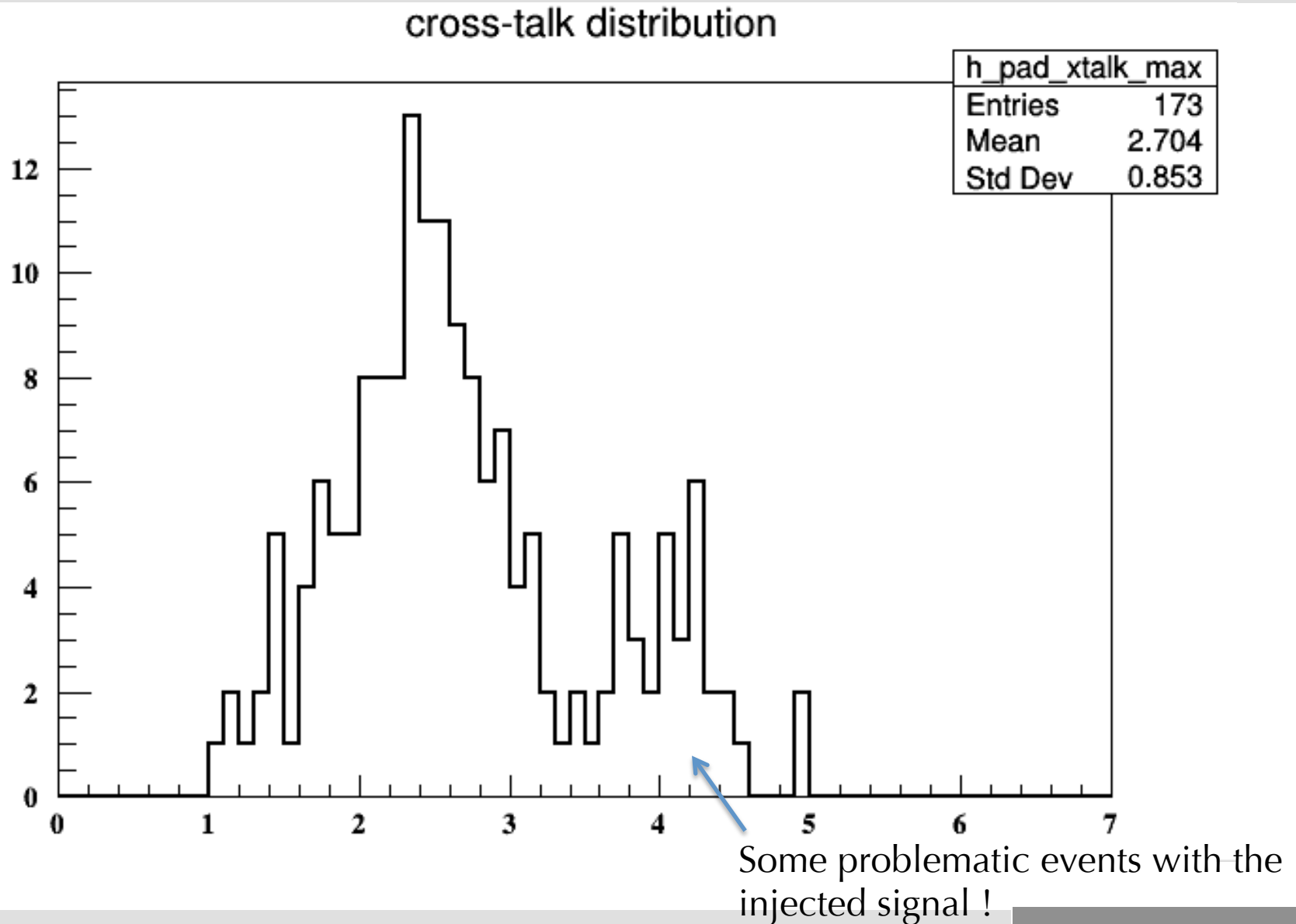
Cross-talk map(%)



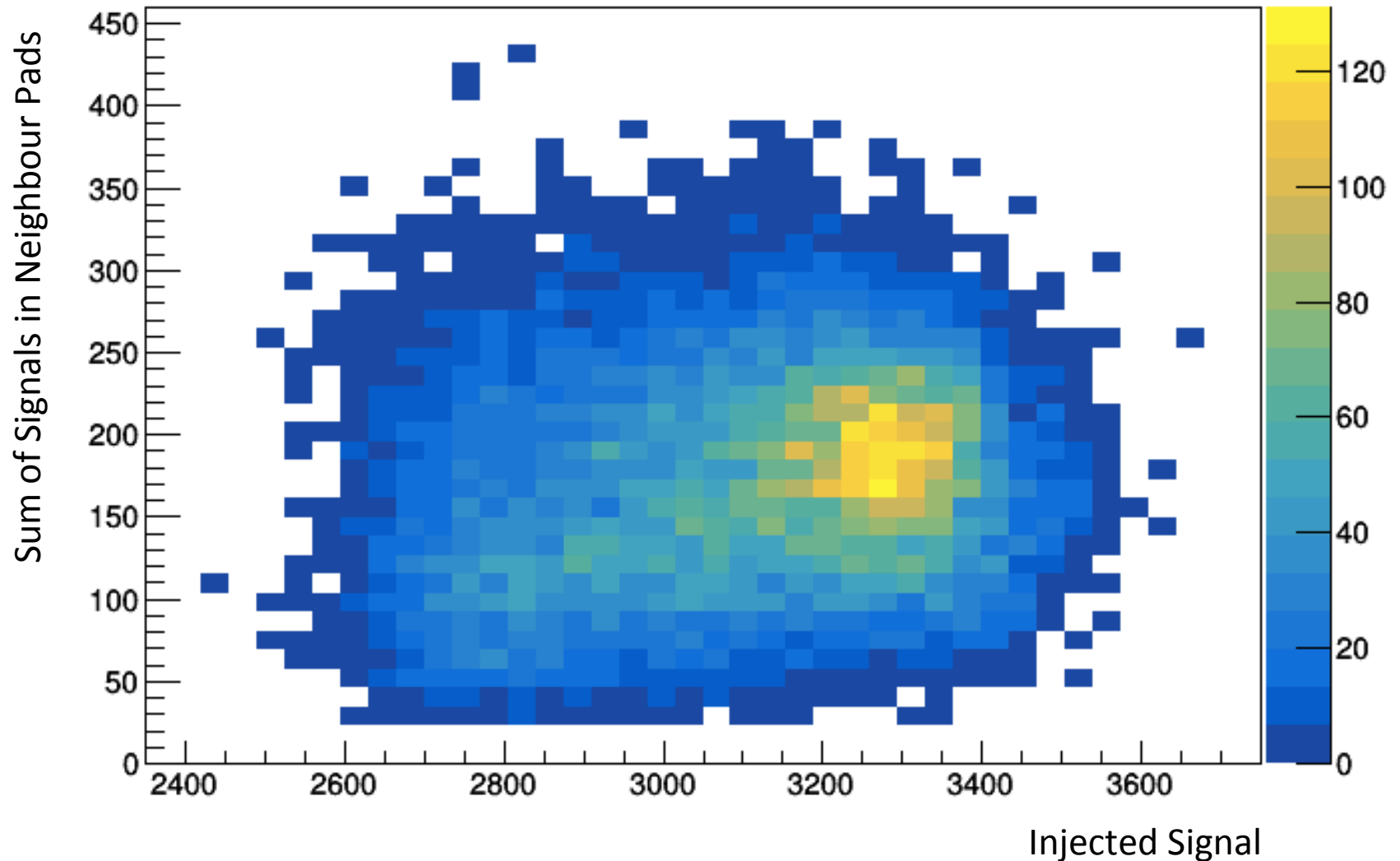
Cross-talk map



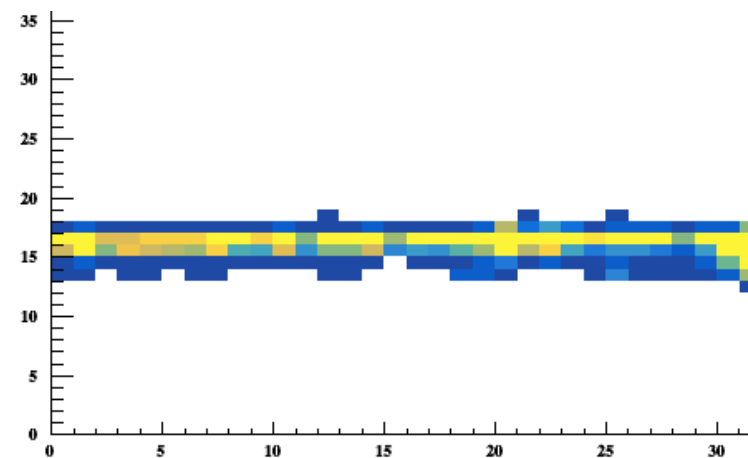
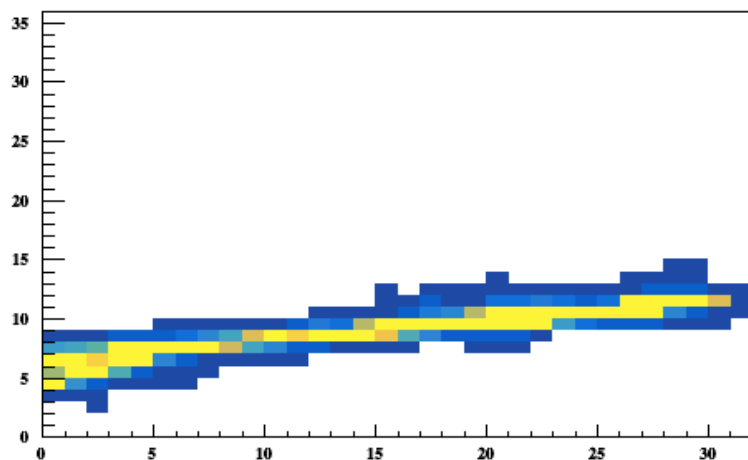
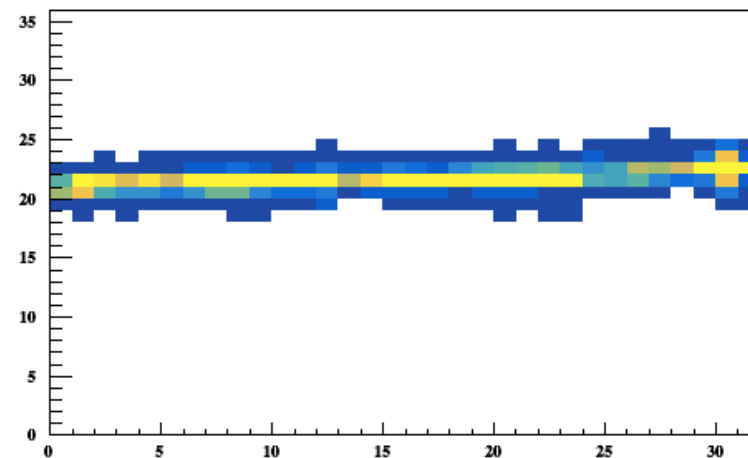
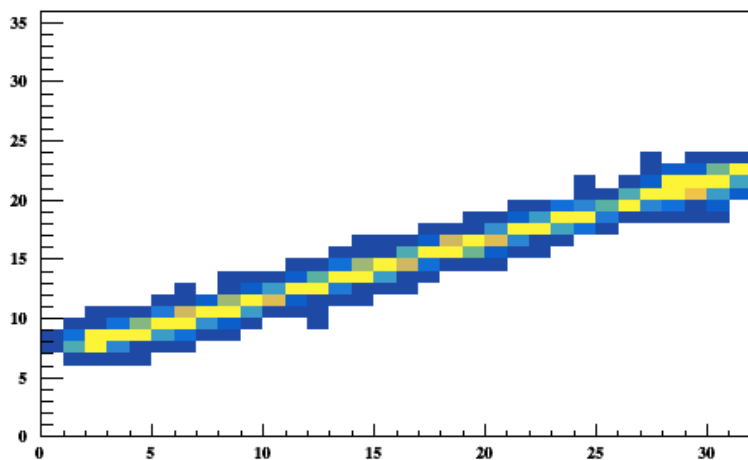
Mean of max x-talk values



Sum of Signals in all Neighbour Pads VS Injected Signal

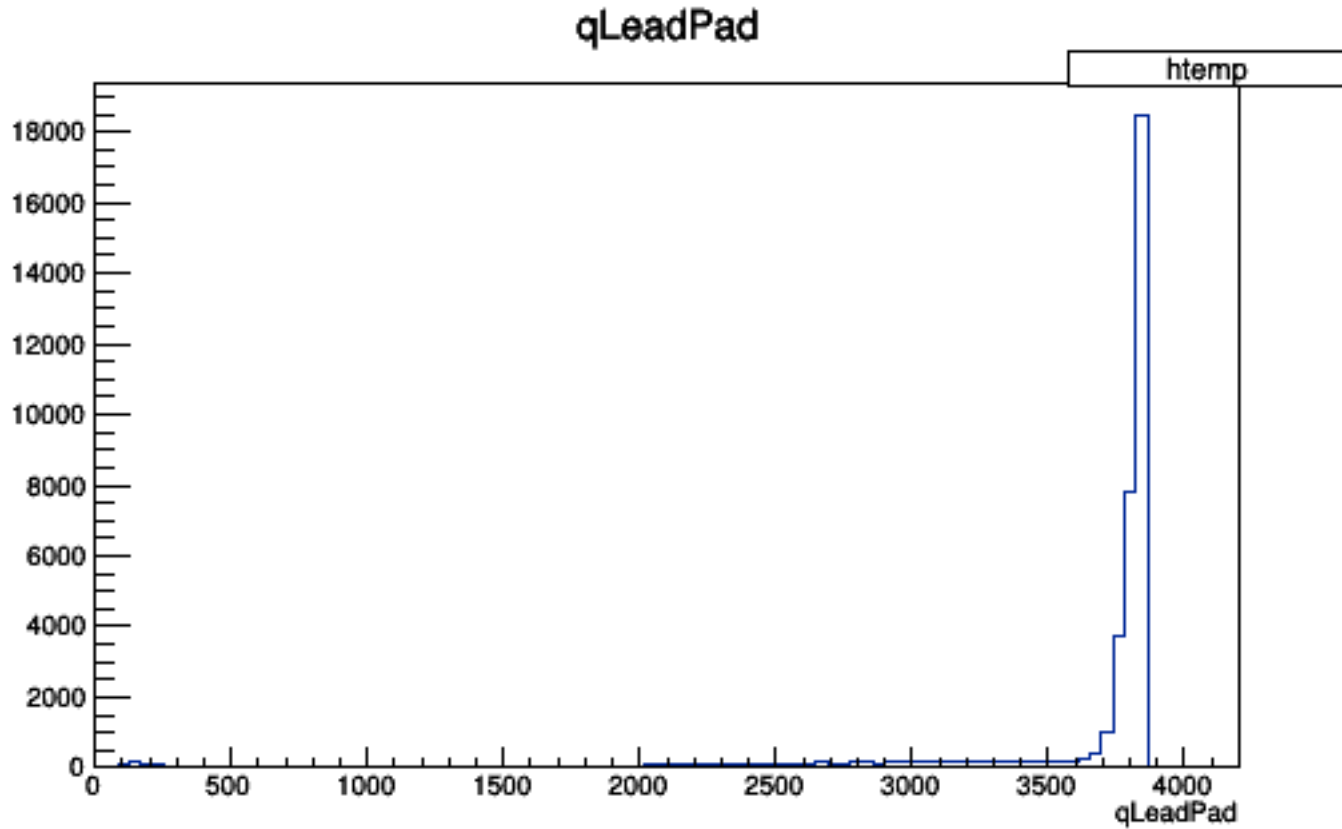


Cross-talk using Cosmics run@390 V??

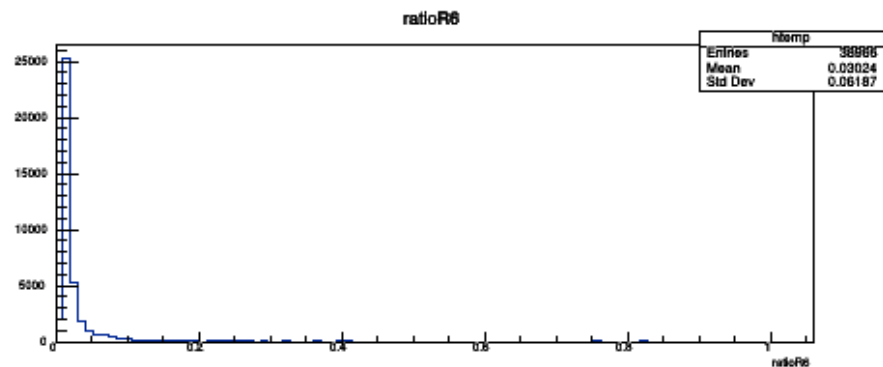
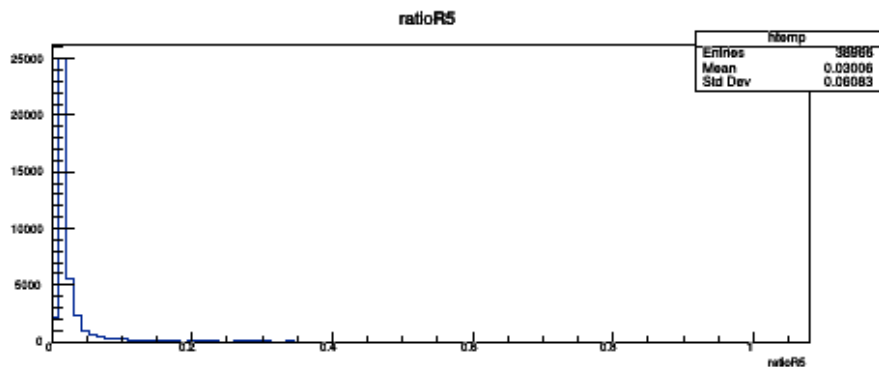
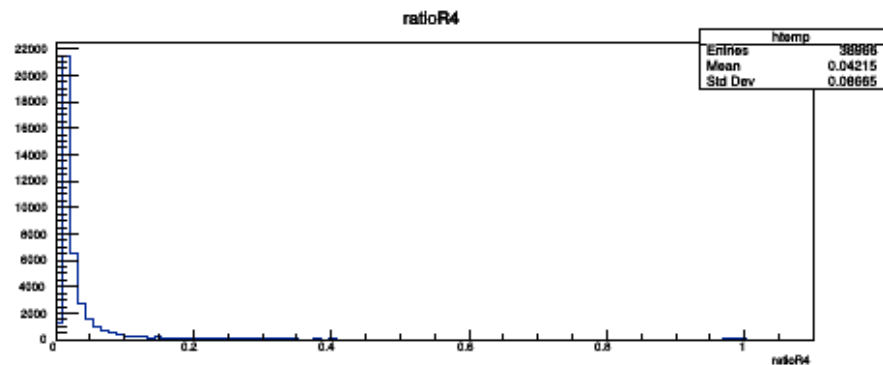
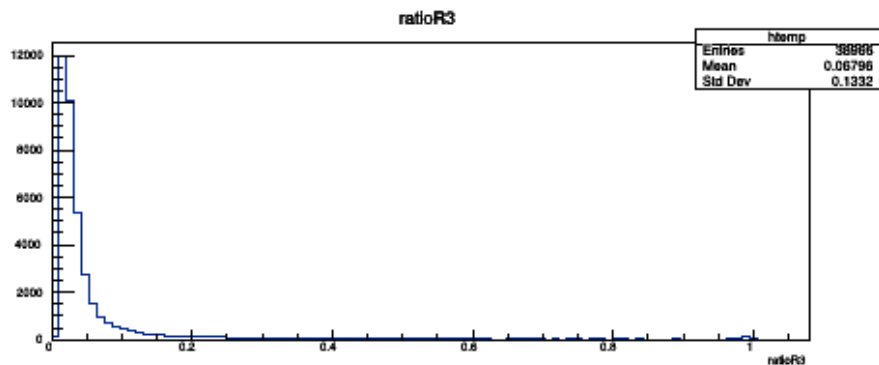
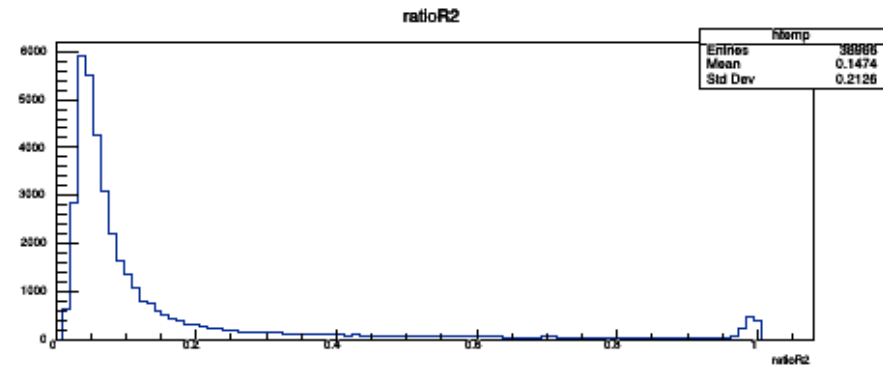
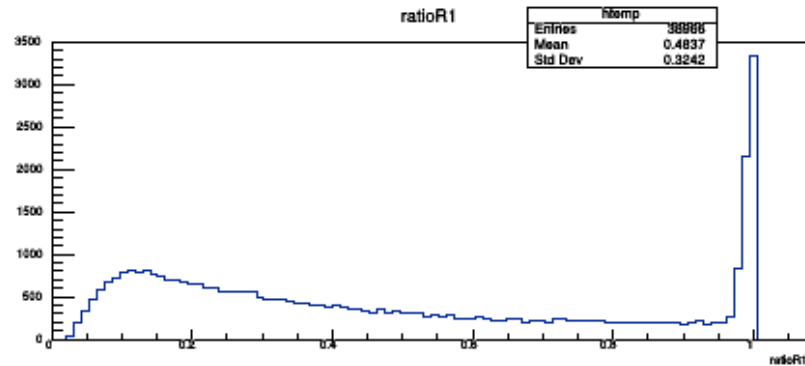


- Select high cluster multiplicity events (at least 6 pads)
- Sort the pads in a cluster in term of charge

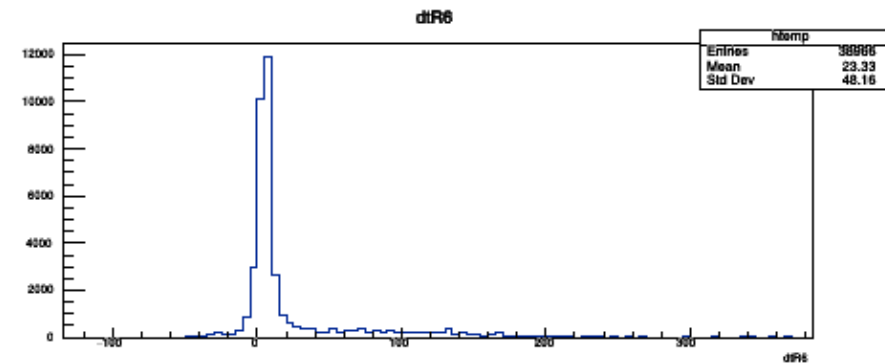
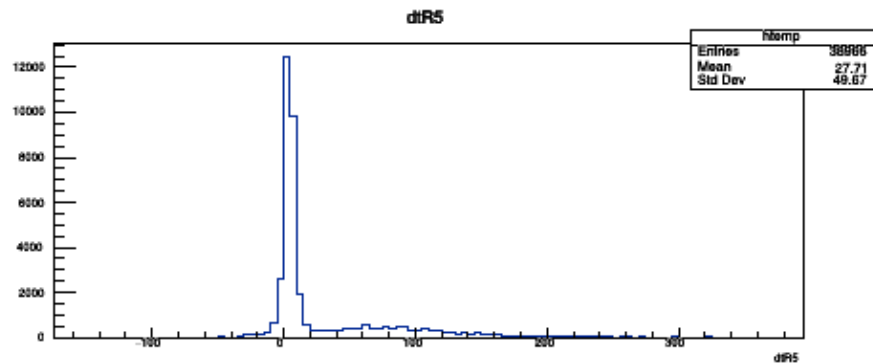
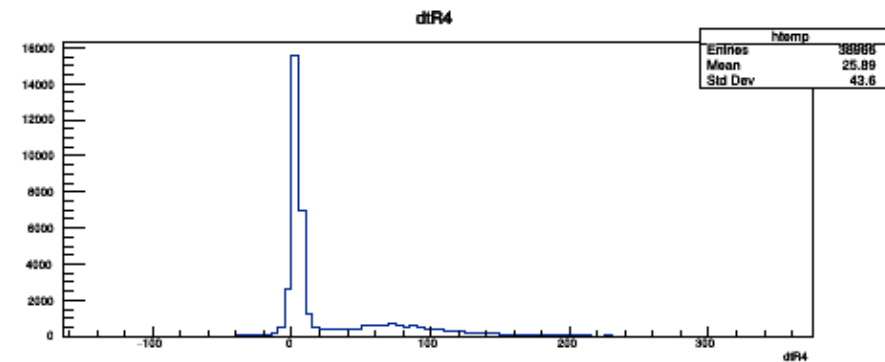
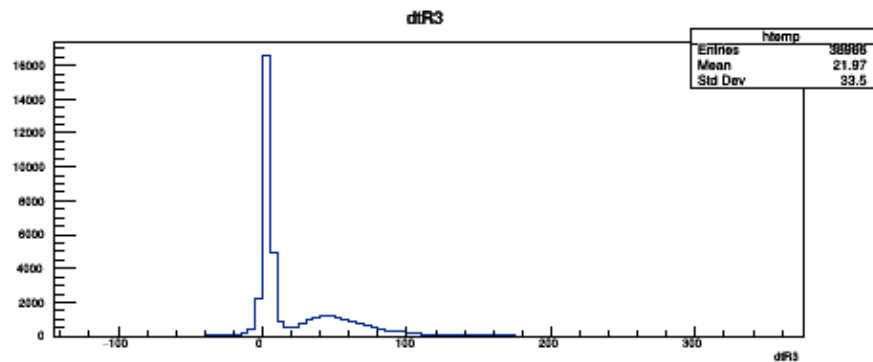
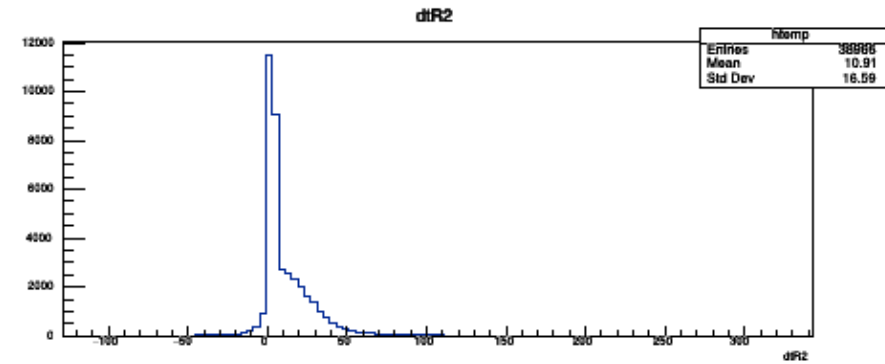
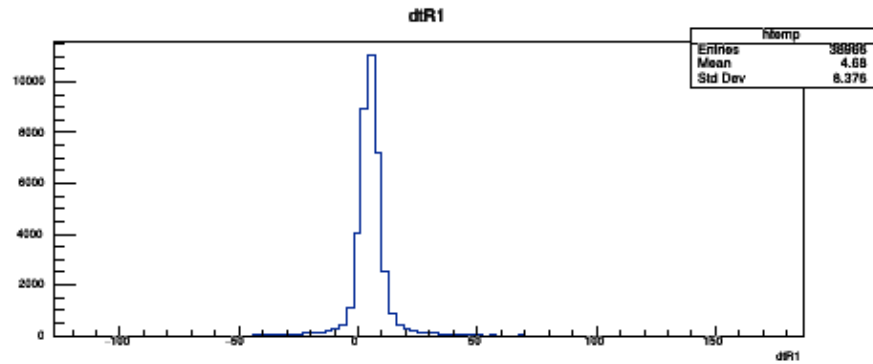
Charge of the Leading Pads



Charge in Neighbour / Charge Leading Pads

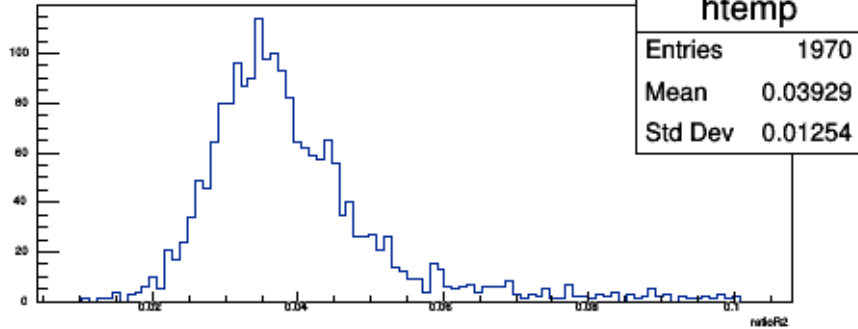


$\Delta t(\text{Neighbour} - \text{Leading})$ Pads

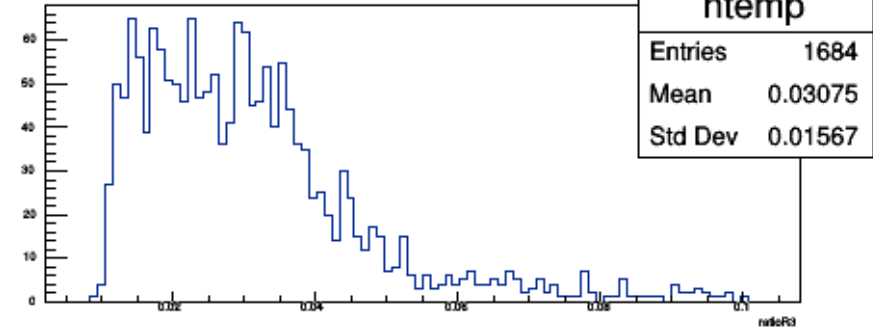


Charge in Neighbour /Charge Leading Pads for $\Delta t = 0$

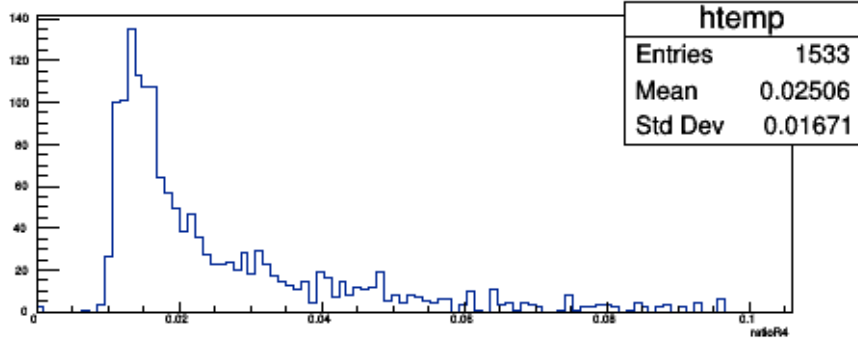
ratioR2 {dtR2==0 && ratioR2<0.1}



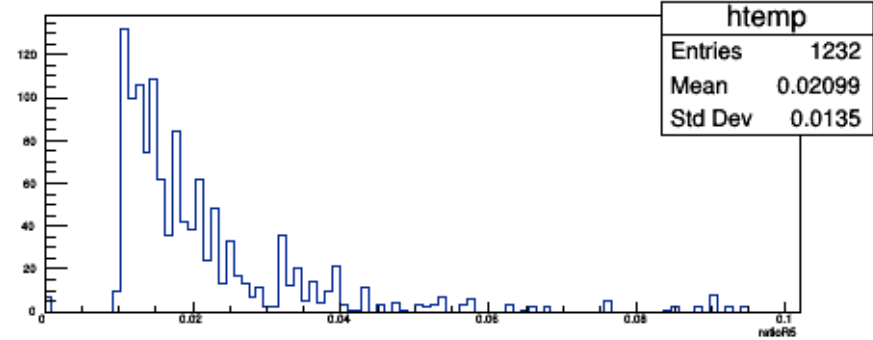
ratioR3 {dtR3==0 && ratioR3<0.1}



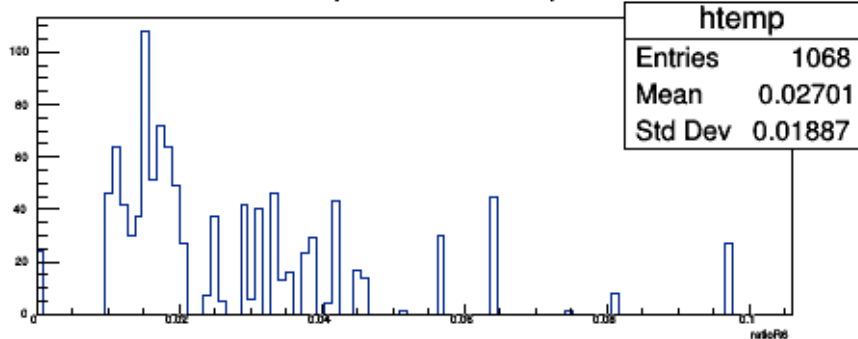
ratioR4 {dtR4==0 && ratioR4<0.1}



ratioR5 {dtR5==0 && ratioR5<0.1}

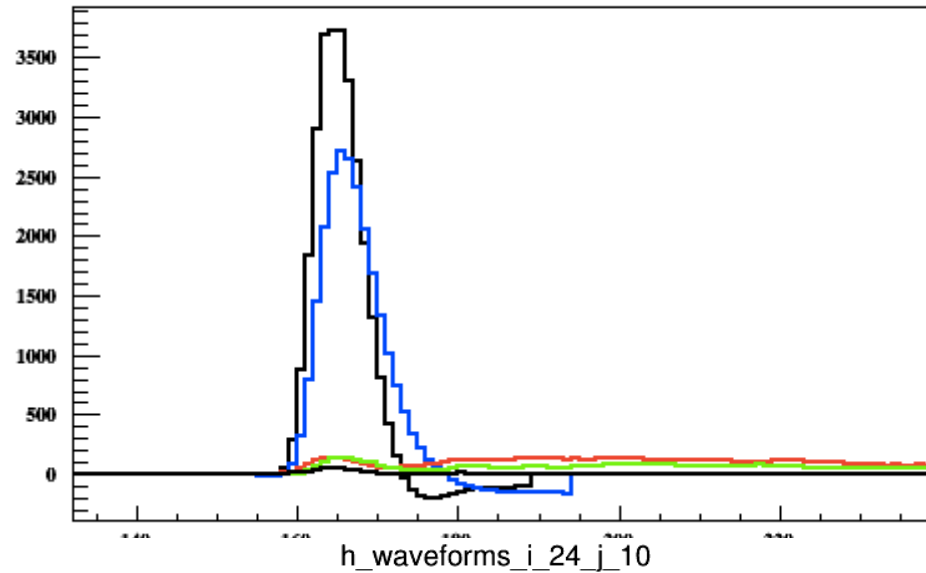


ratioR6 {dtR6==0 && ratioR6<0.1}

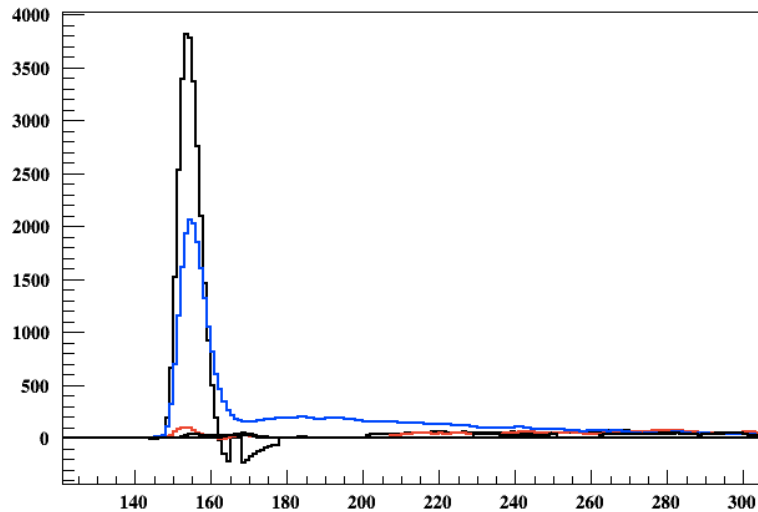


Waveforms

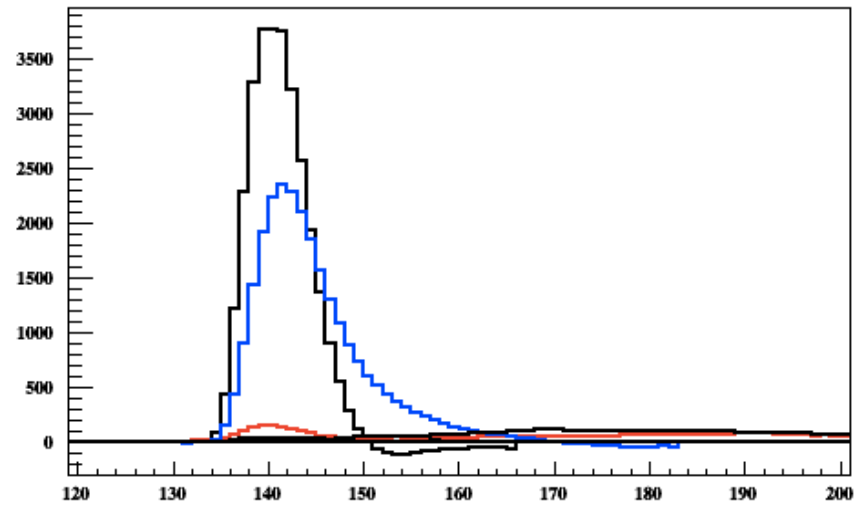
h_waveforms_i_3_j_17



h_waveforms_i_24_j_10

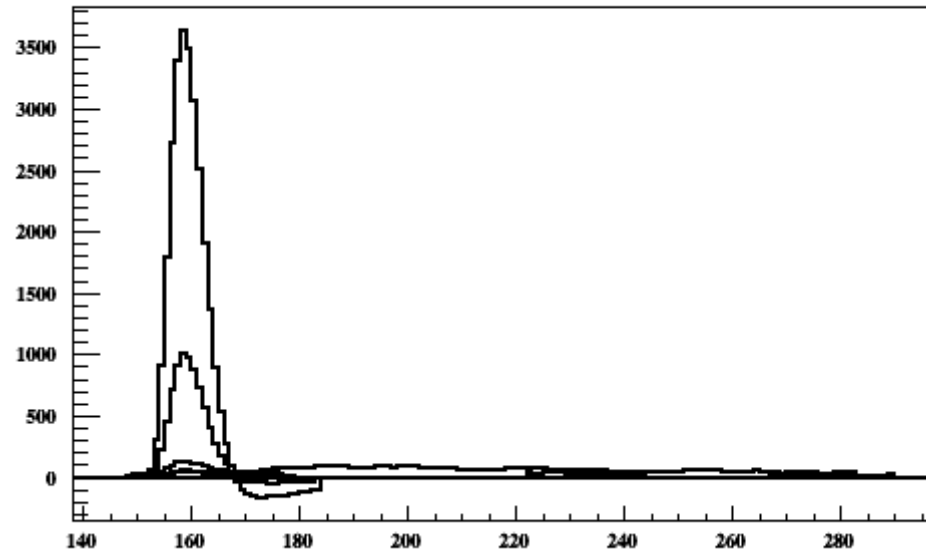


h_waveforms_i_21_j_19

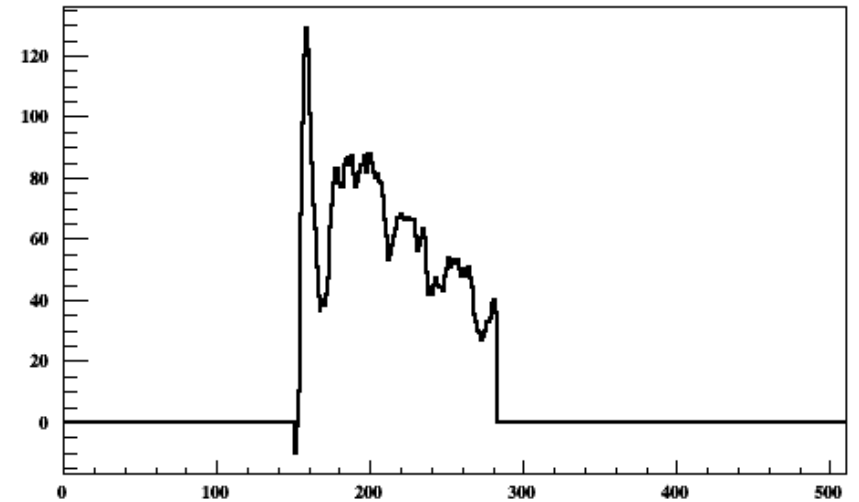


Waveforms

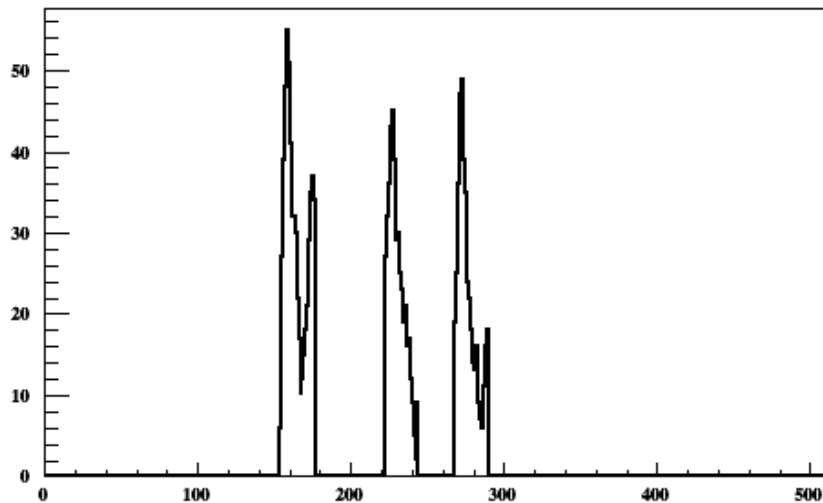
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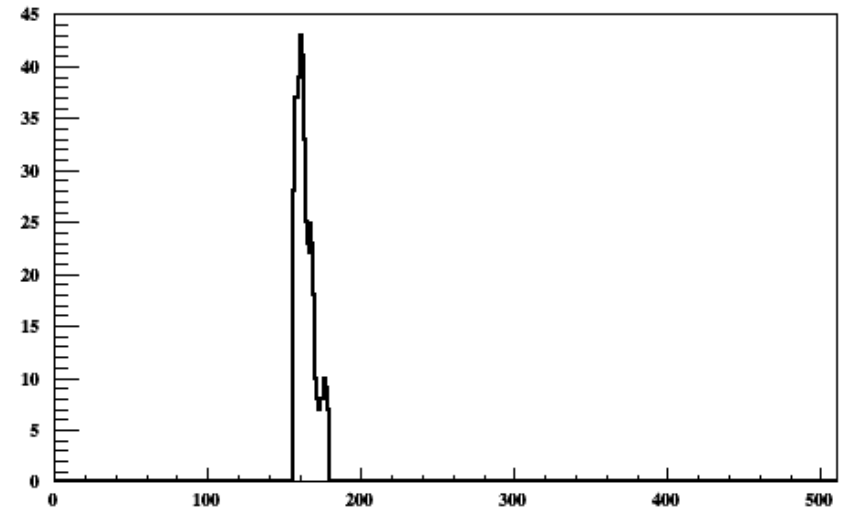
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h_waveforms_i_4_j_19

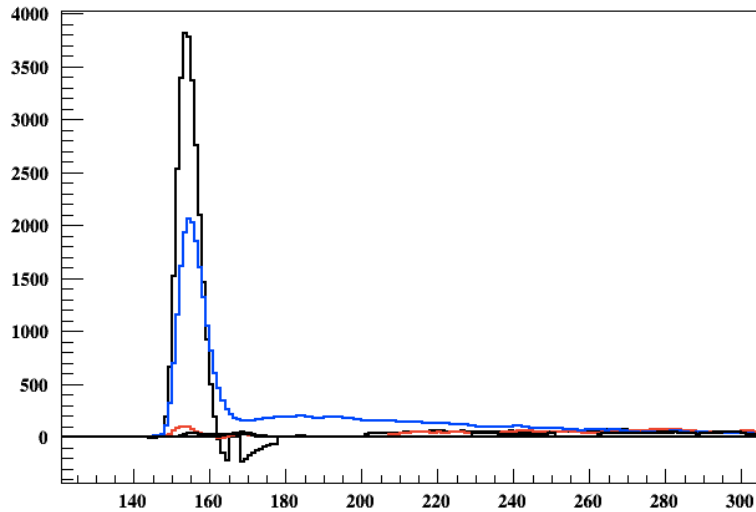


h_waveforms_i_4_j_23

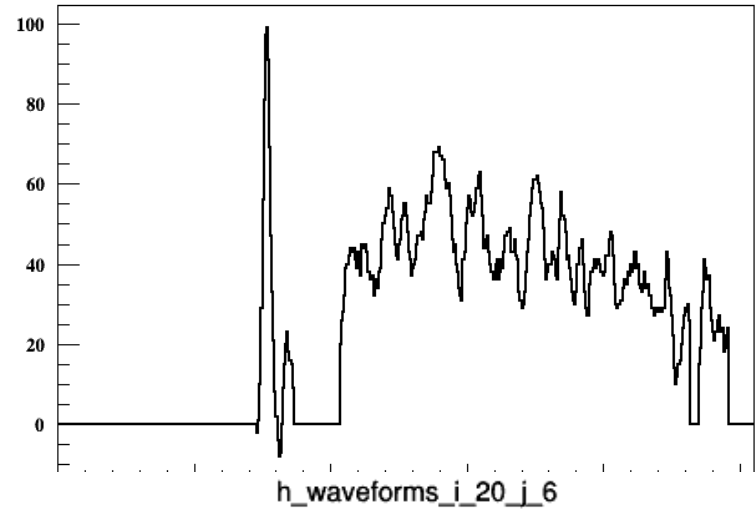


Waveforms

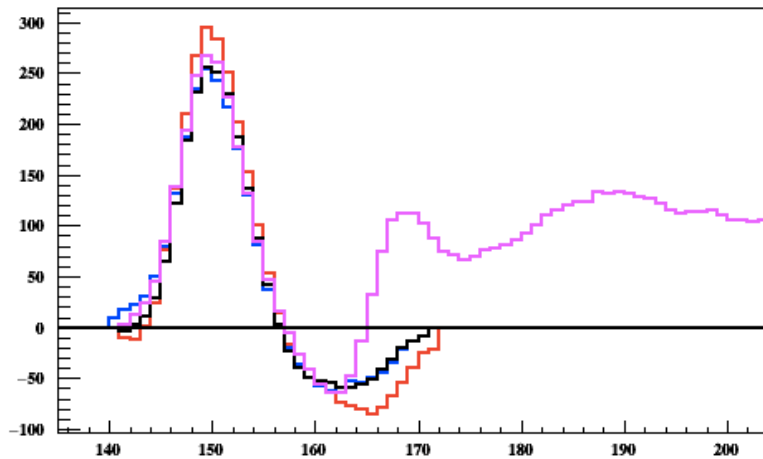
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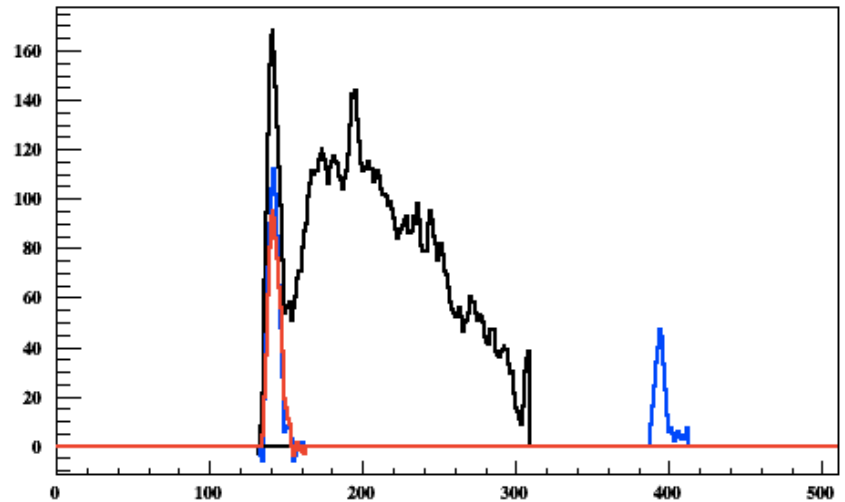
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h_waveforms_i_2_j_17

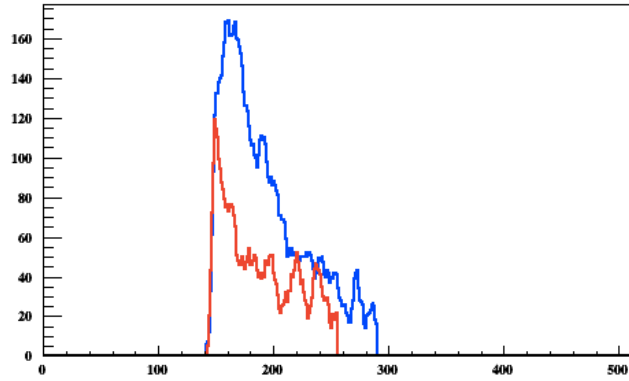


h_waveforms_i_20_j_6

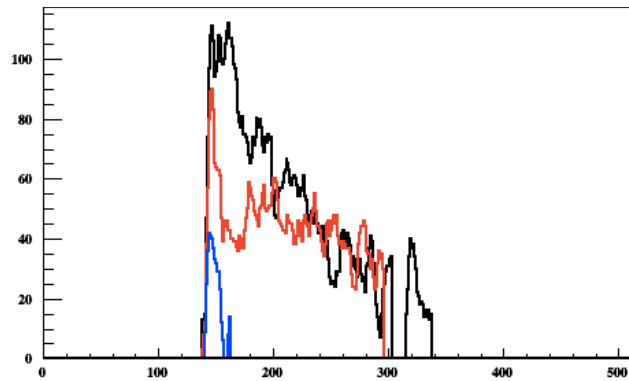
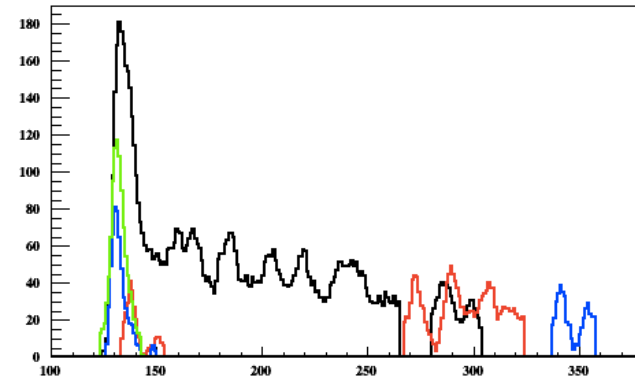


Waveforms

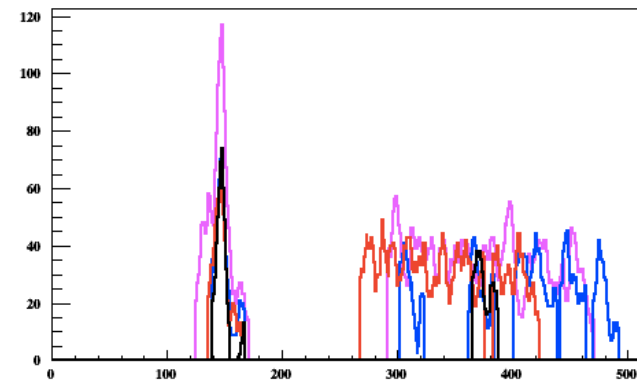
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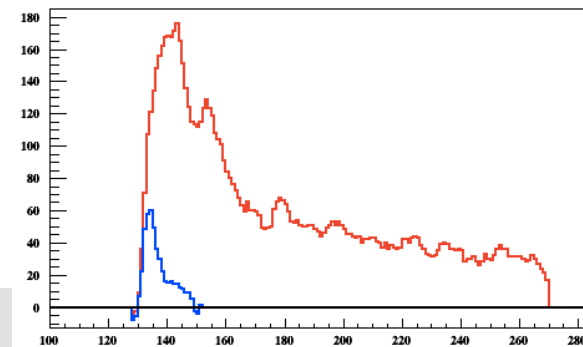
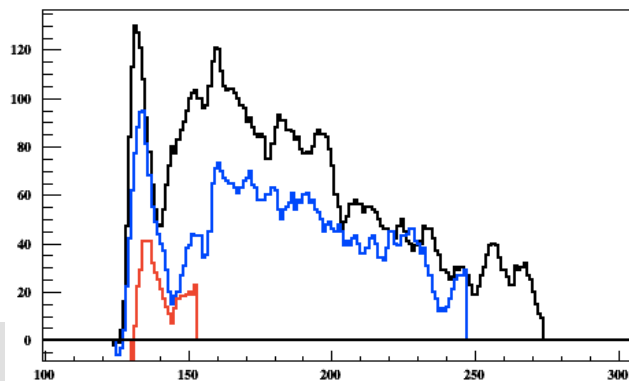
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n_waveforms_i_11_j_12

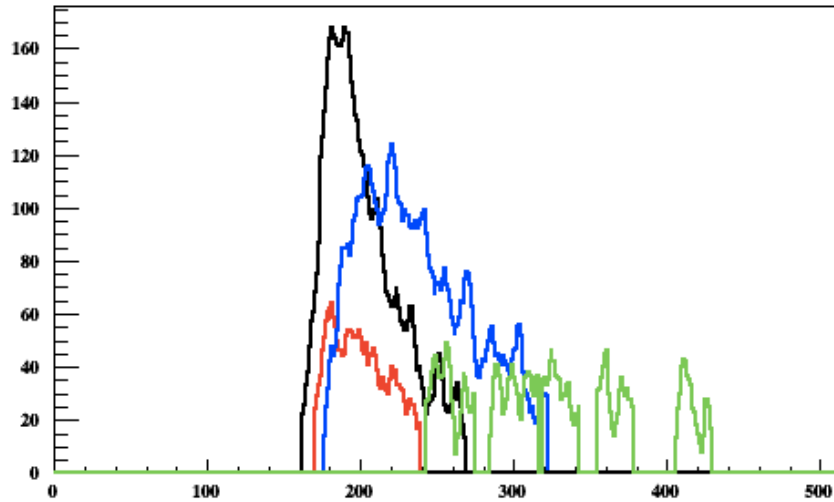


h_waveforms_i_19_j_26

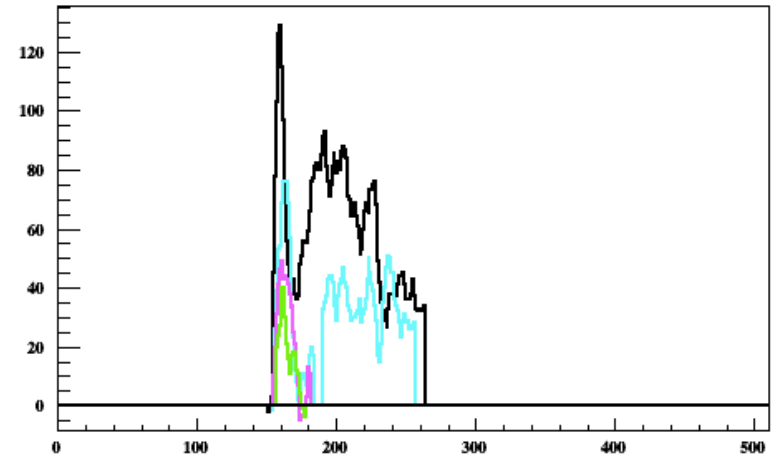


Waveforms

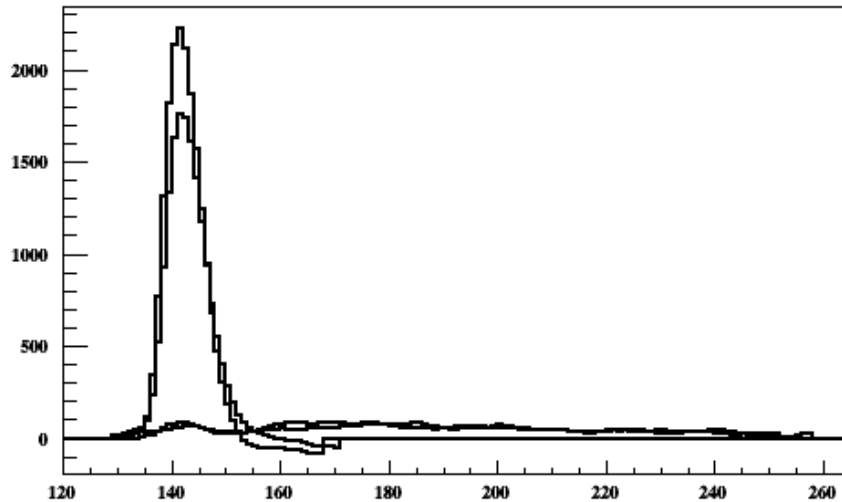
h_waveforms_i_27_j_24



h_waveforms_i_6_j_10



h_waveforms_i_24_j_3



h_waveforms_i_24_j_2

