

## ORCA-6

- Relative efficiencies/gains
- New gains/efficiencies after HV tuning

# ORCA efficiencies/gains

relative to value in run 7953 (~1 day after HV tuning)

Using output from Paolo Fermani's processing:

*/sps/km3net/users/pfermani/antares\_km3/K40/data\_processing\_new/prod/data/  
KM3NeT\_00000049/v5.7\_PMTeff/calibration/*

Run# 7221 (26 January 2020) to Run# 8962 (21 November 2020)

Around run **index** ~400 a HV tuning had been applied

-> gain change clearly visible

After around run **index** ~800 the processing used the updated K40 model

-> efficiency values change

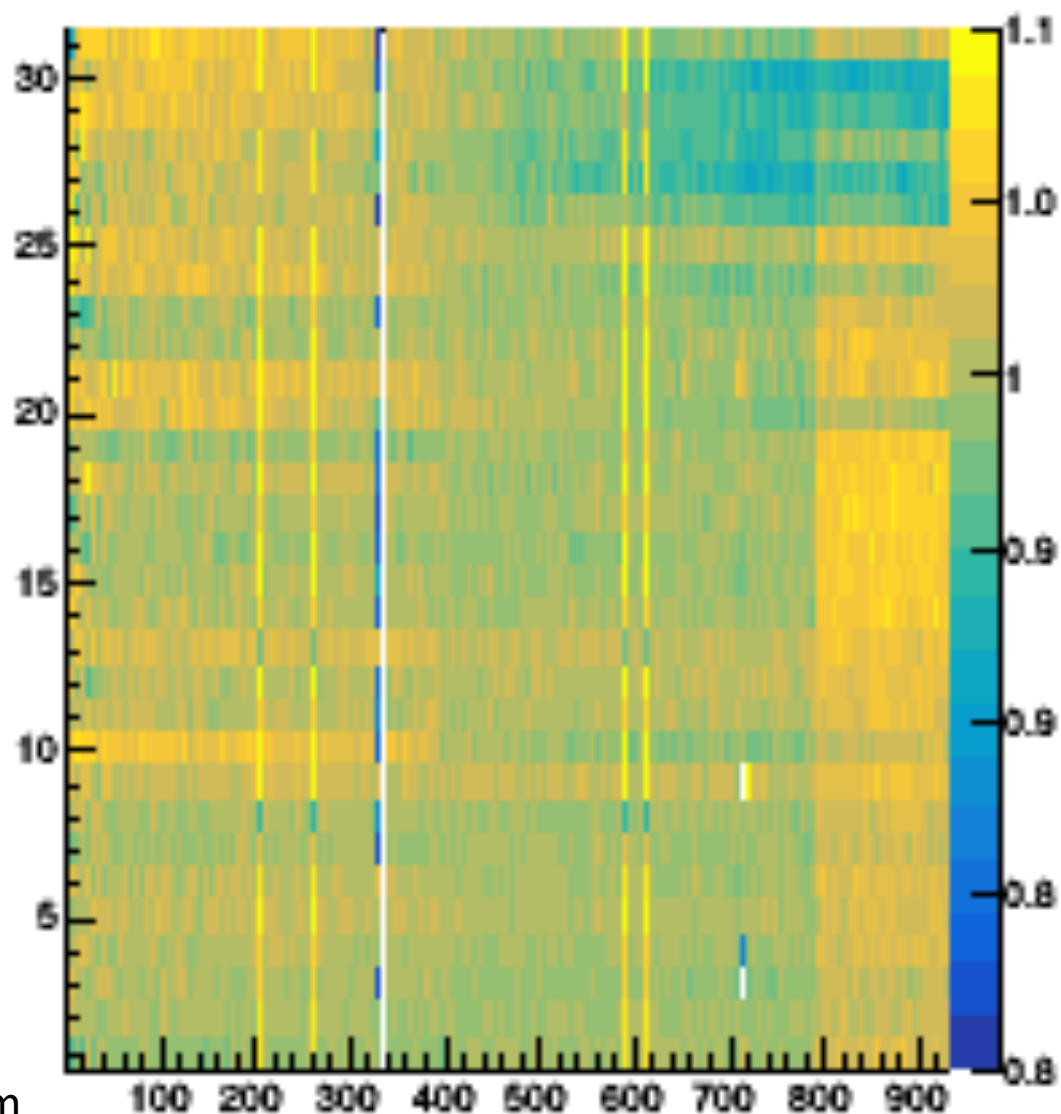
DU9DOM9.QE

DU9DOM9.gain

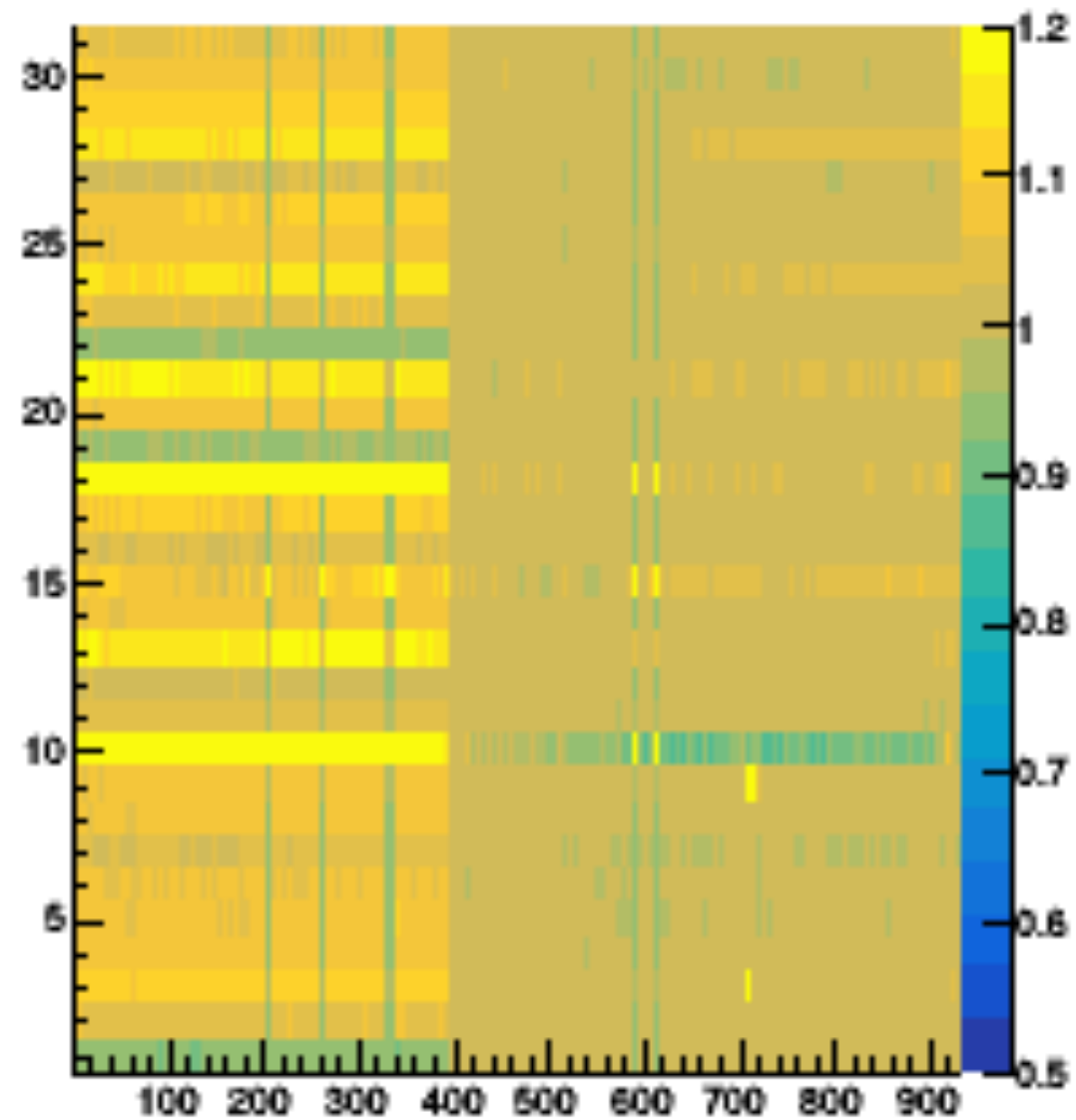
top

PMT  
index  
sorted  
ringwise

bottom



Run index



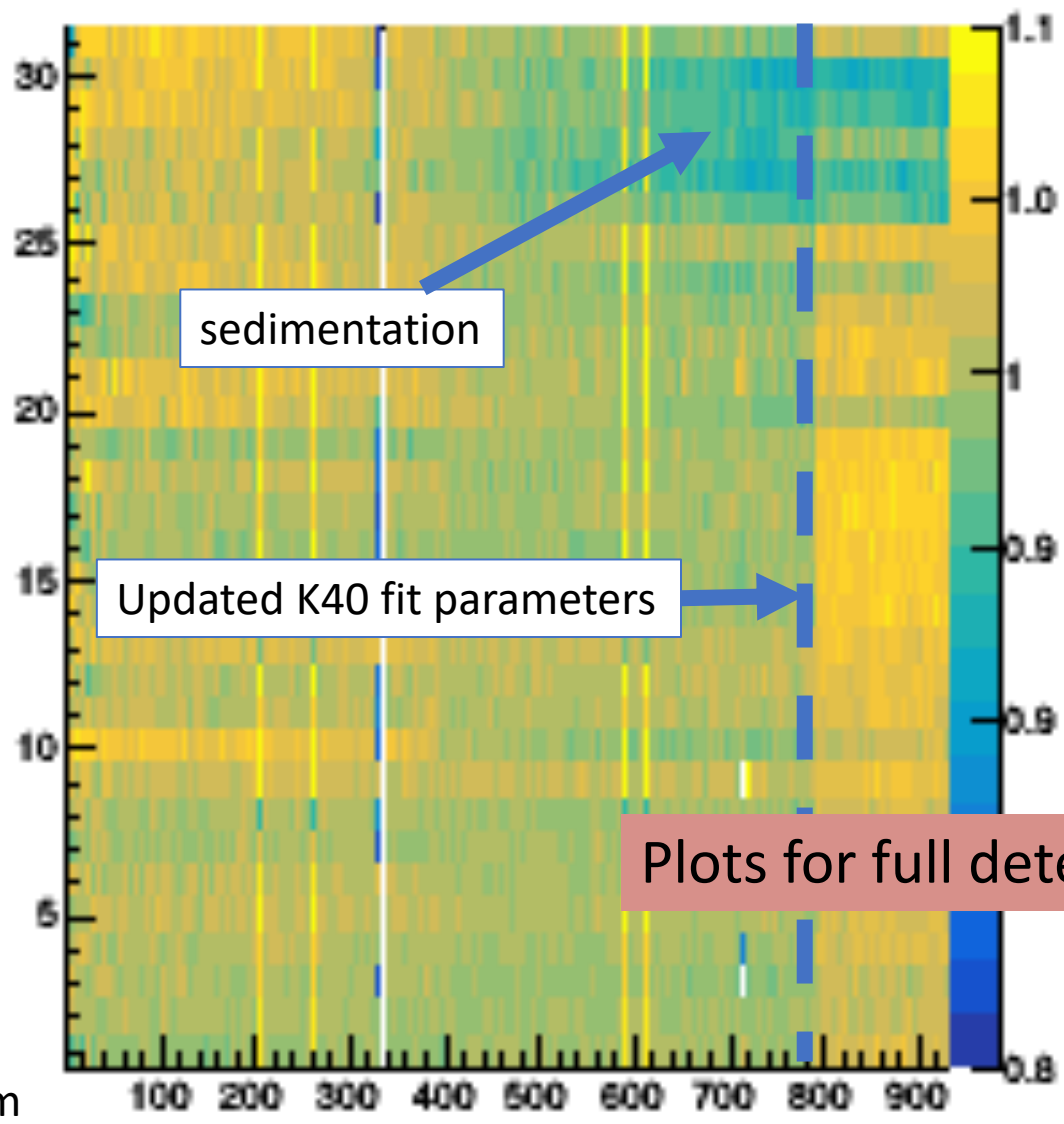
Run index

PMT  
index  
sorted  
ringwise

top

bottom

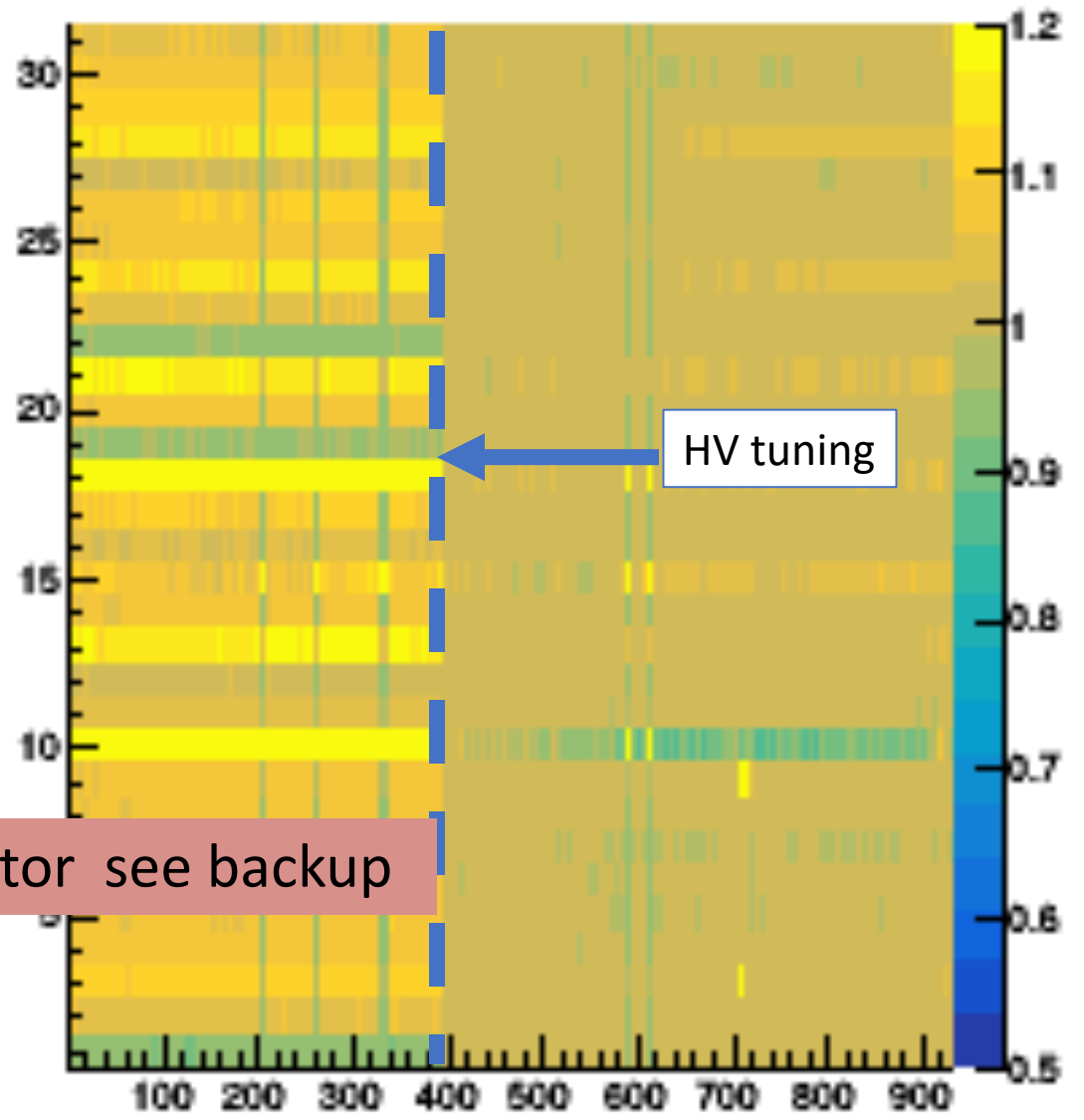
DU9DOM9.QE



sedimentation

Updated K40 fit parameters

DU9DOM9.gain



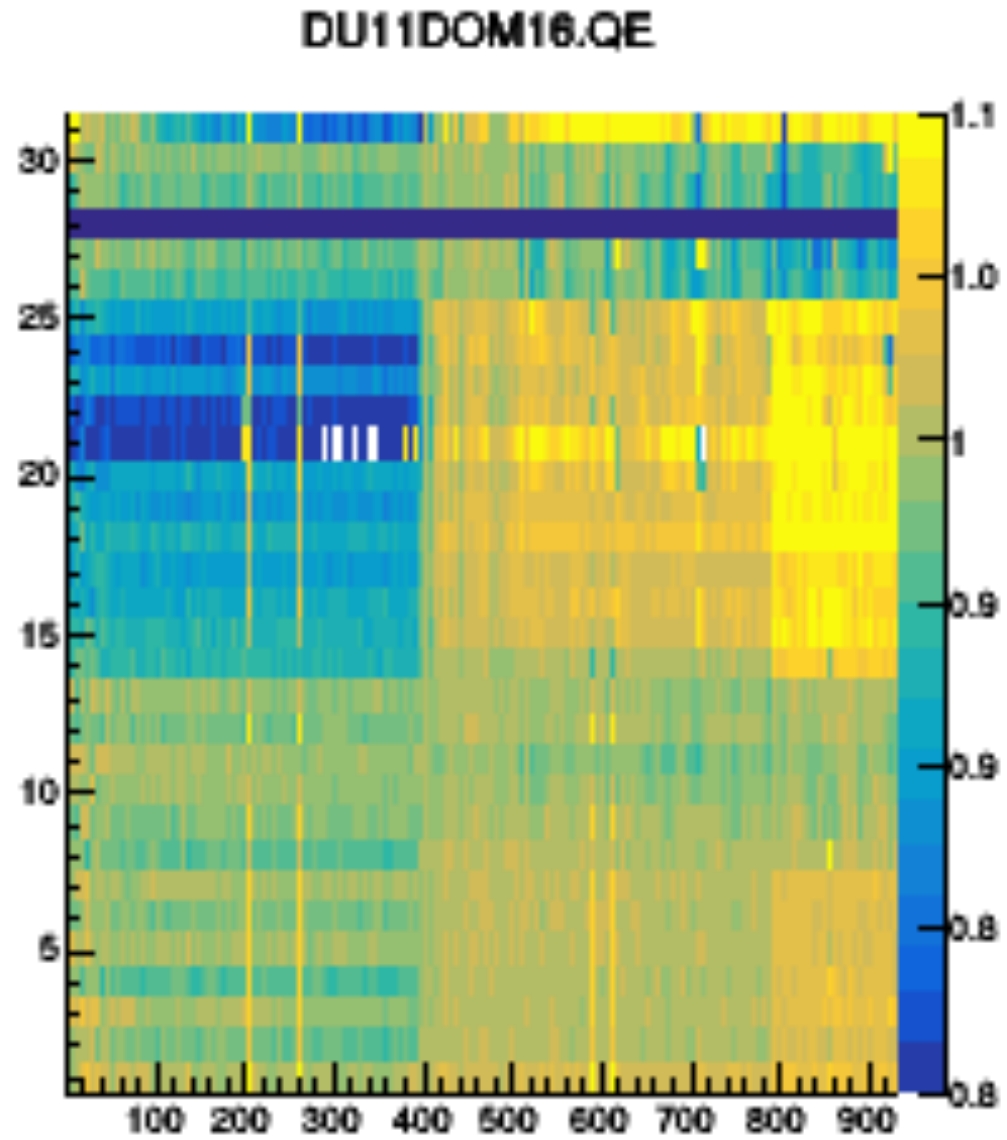
HV tuning

Plots for full detector see backup

### DU11 DOM 16:

Strange efficiency **increase** (!)  
in rings D and E after HV  
tuning (up to 20%)!

Nothing special seen in gains

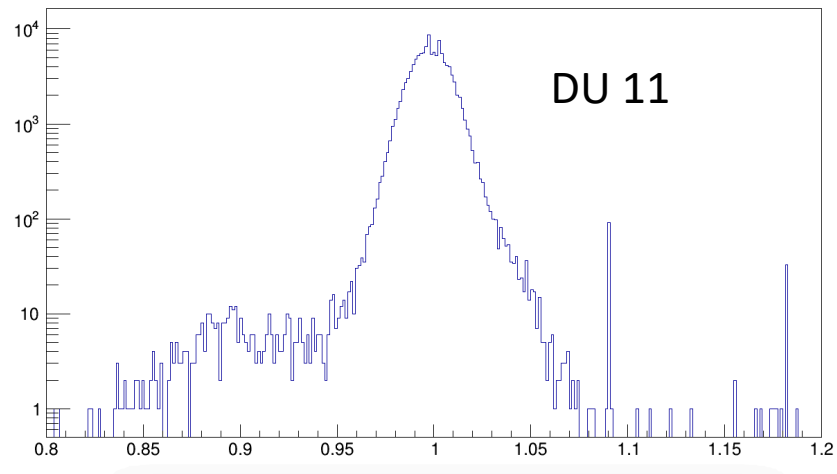
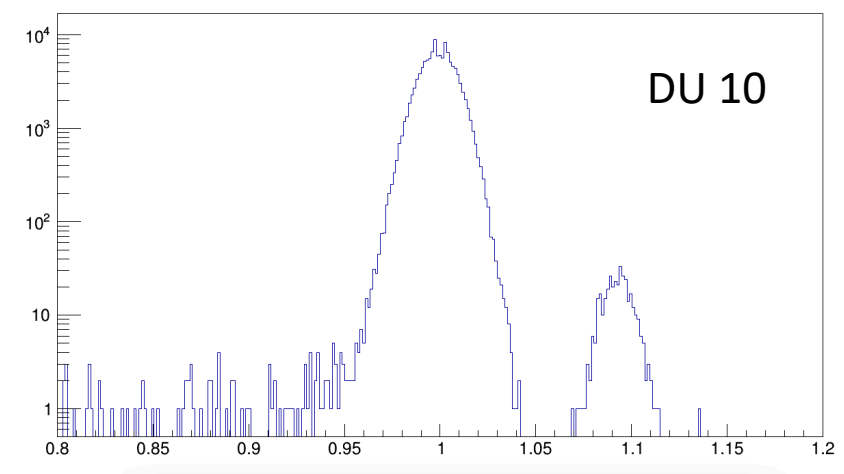
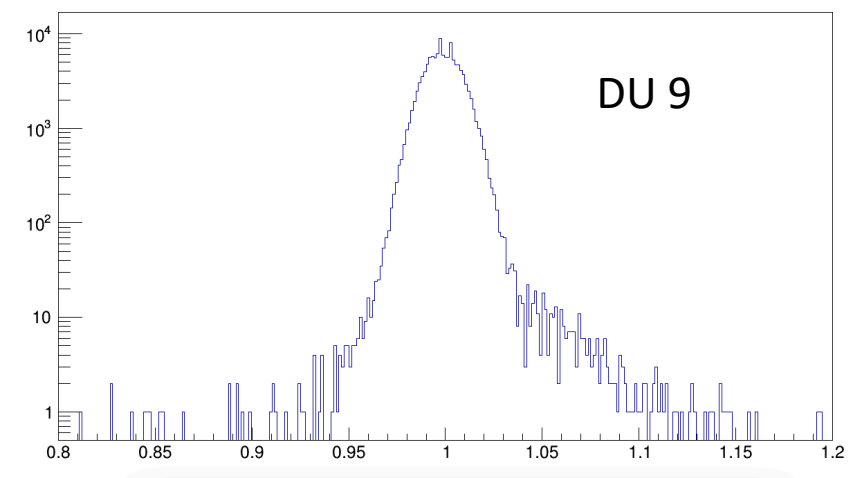
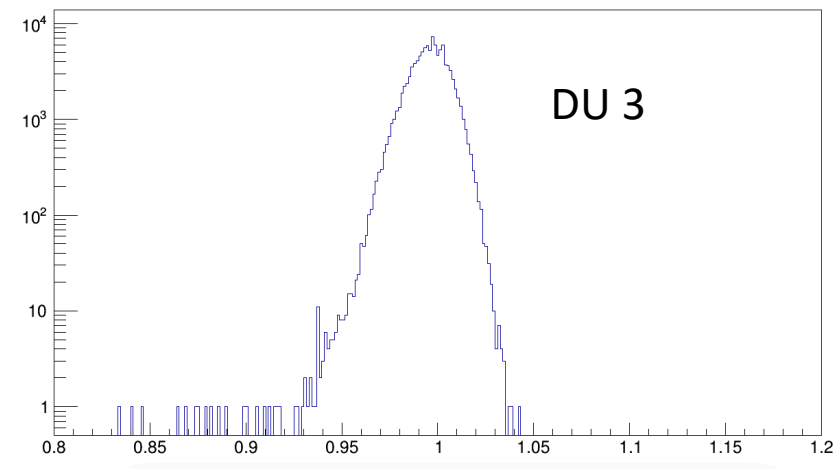
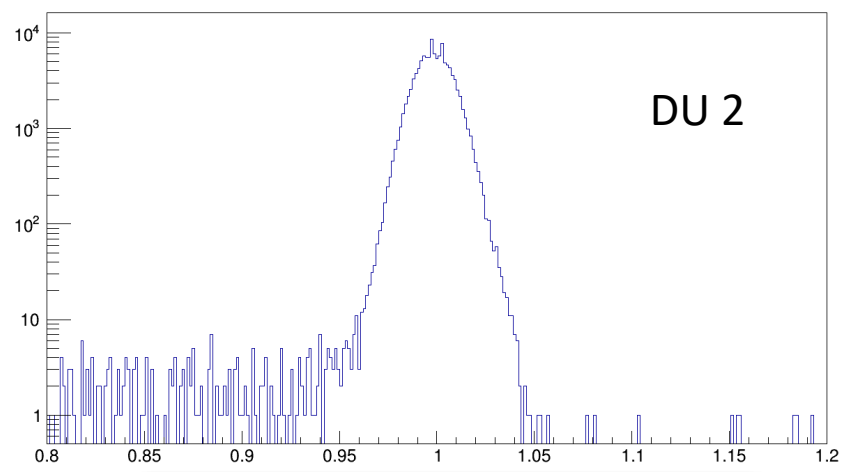
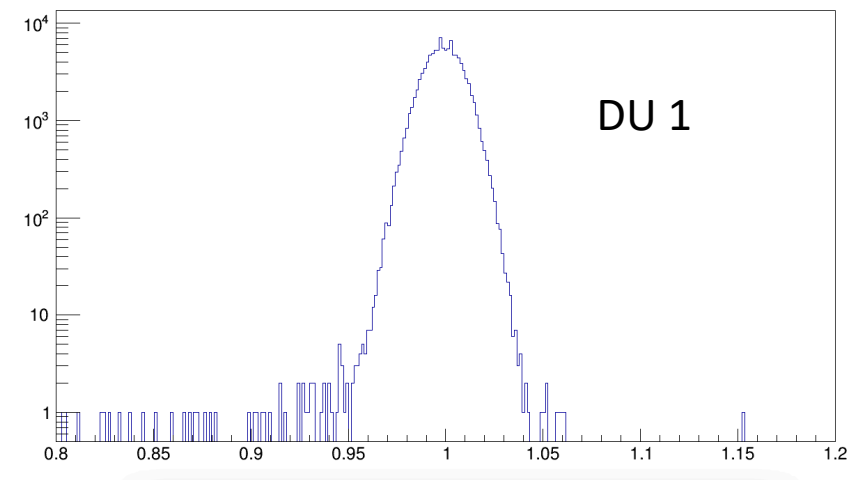


# Distributions of relative efficiencies

-> only runs after HV tuning and before K40 change

-> only channels of bottom hemisphere (avoid sedimentation effects)

=> ~2% statistical scatter

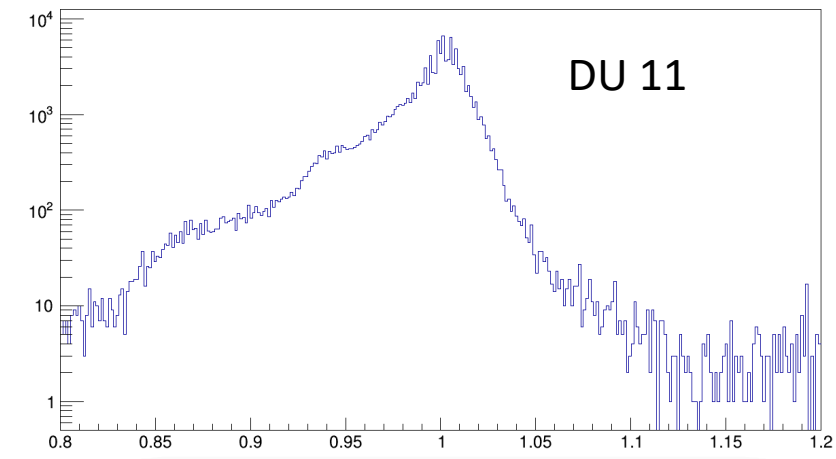
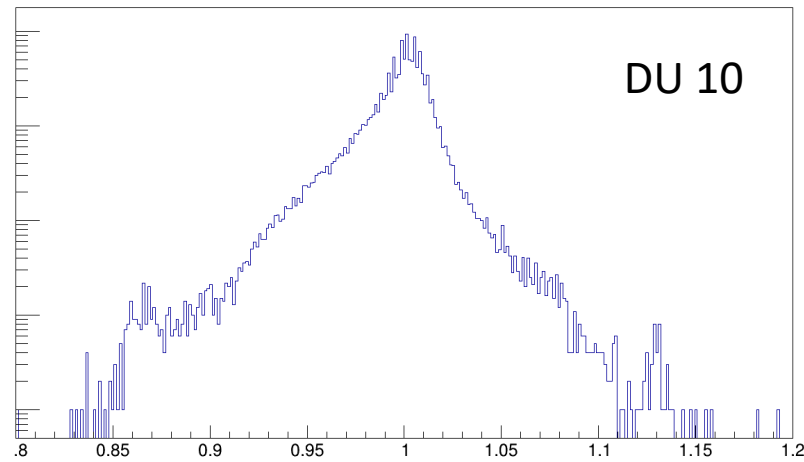
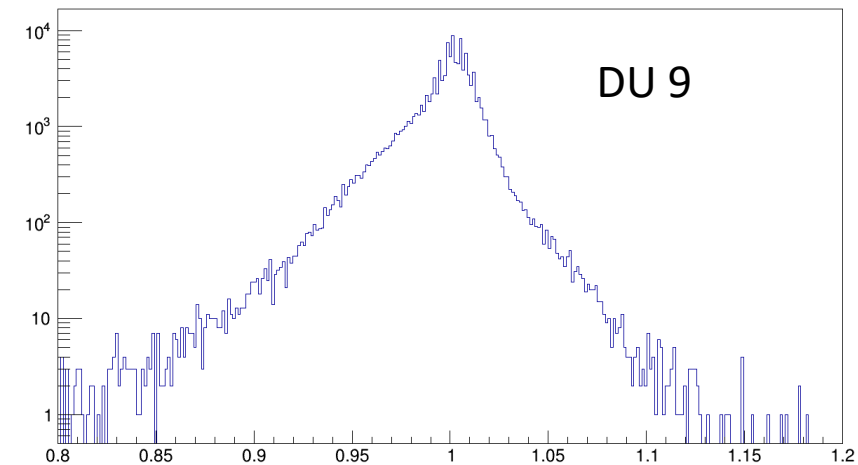
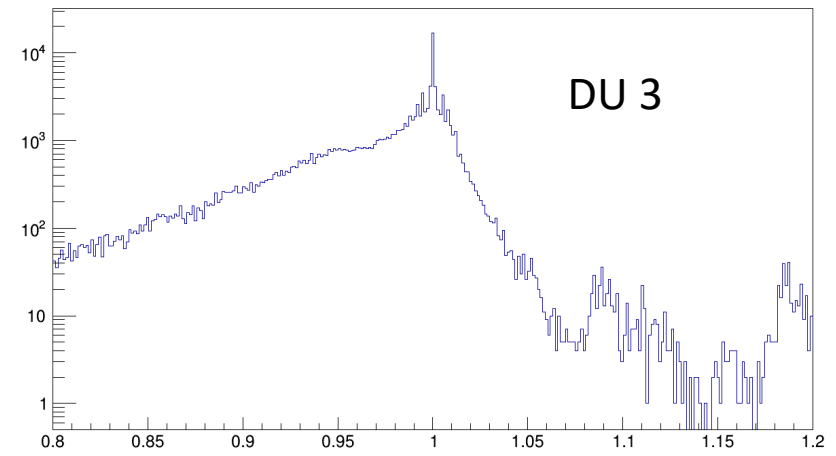
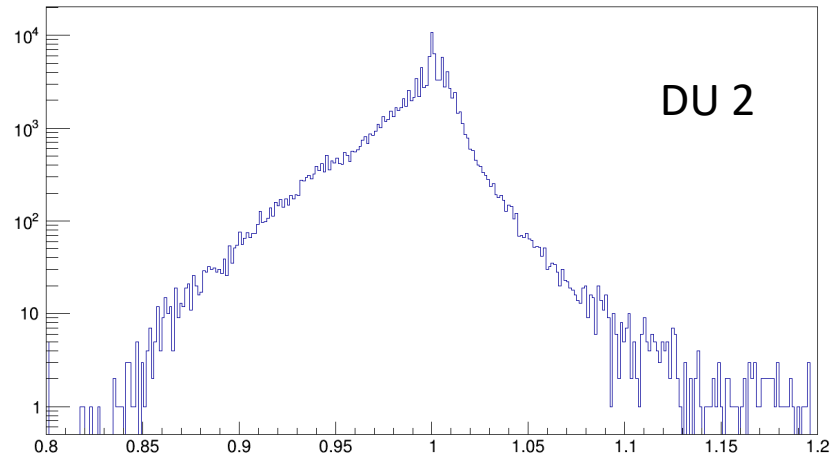
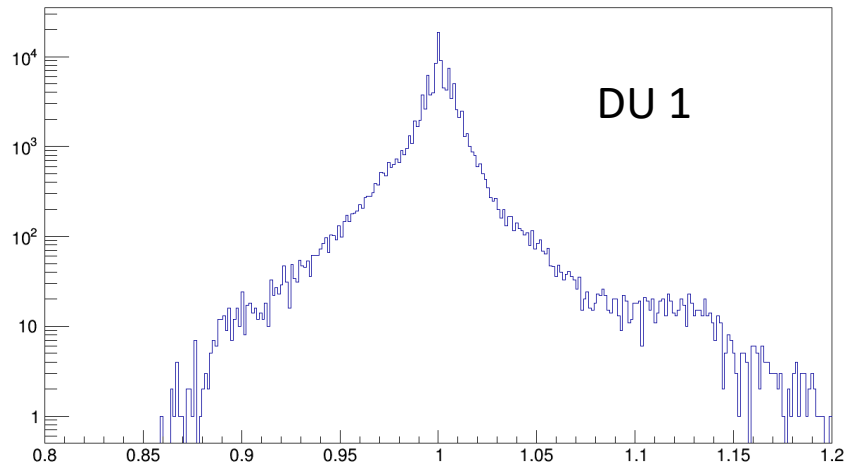


# Distributions of relative gains

-> only runs after HV tuning and before K40 change

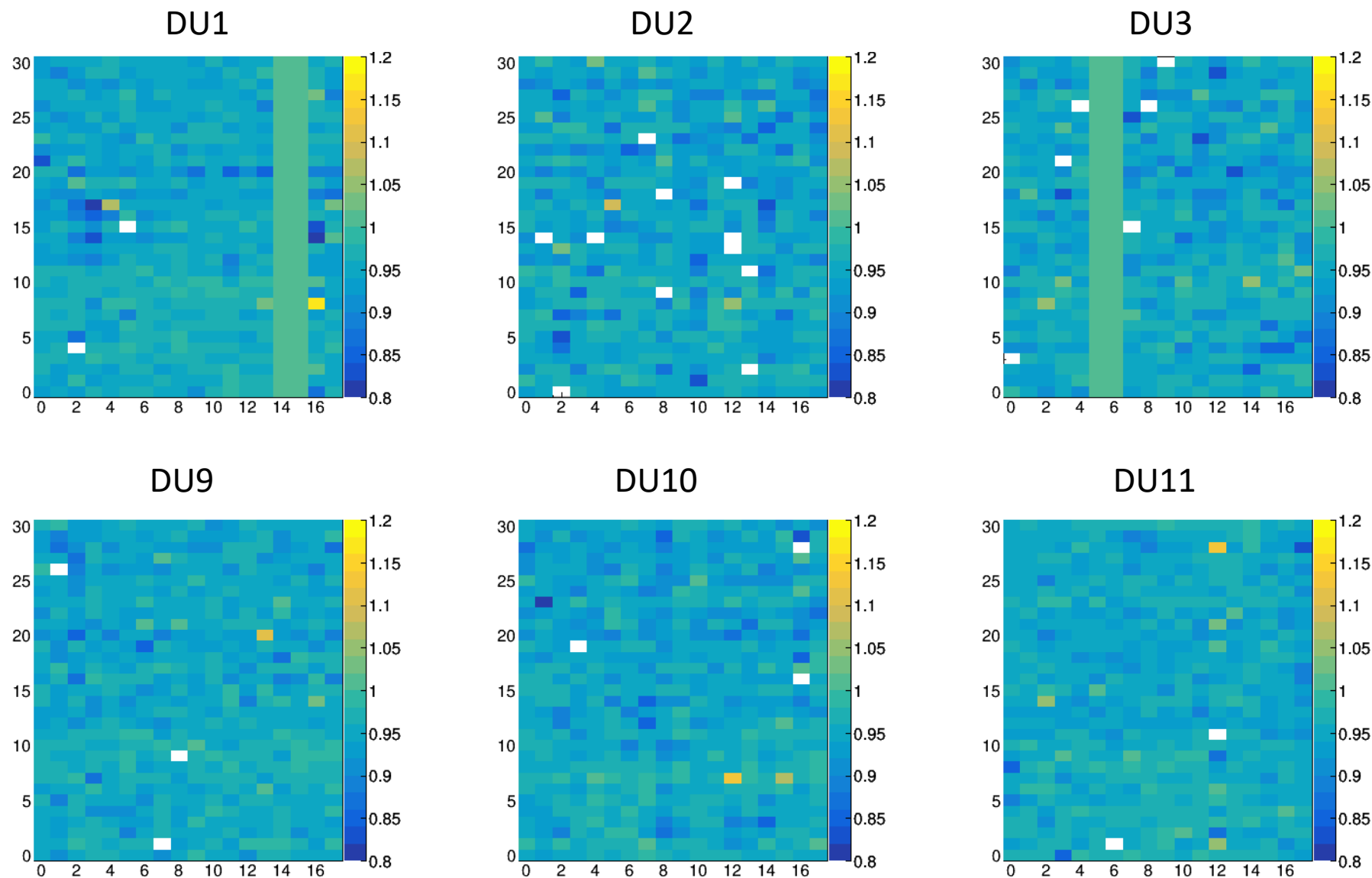
-> only channels of bottom hemisphere (avoid sedimentation effects)

=> non-gaussian distribution, tails of decreasing gain (especially DU3)



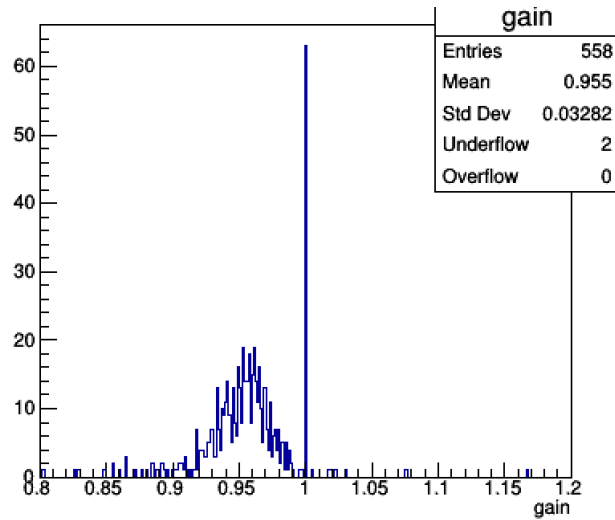
# Gains in run 9109 - after recent HV tuning

(23 known channel failures)

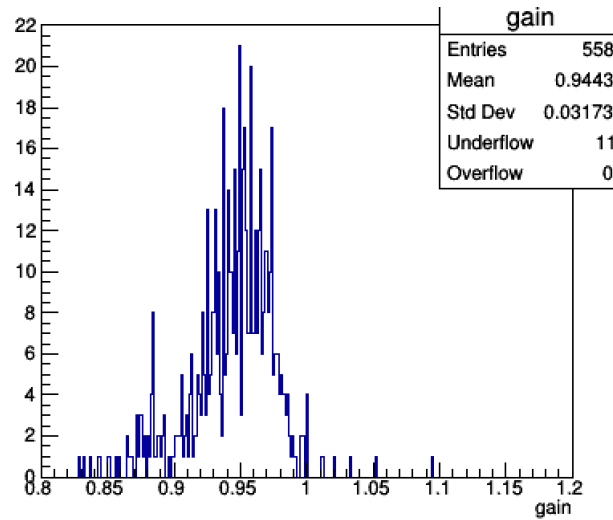




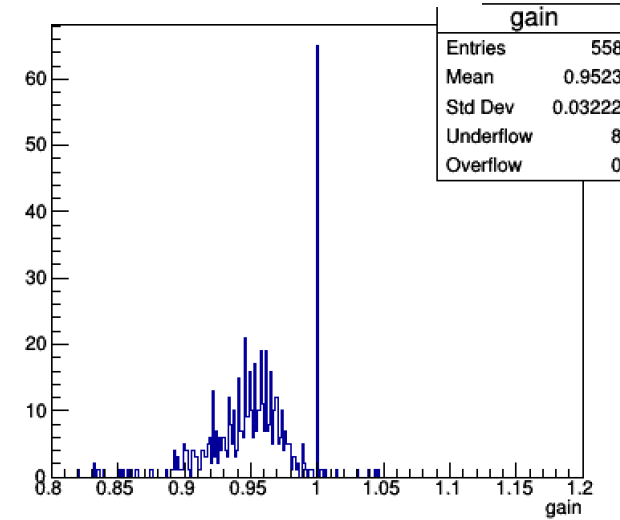
DU1



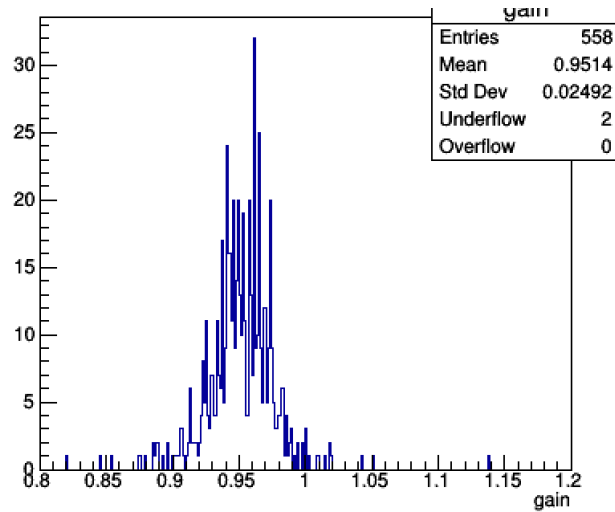
DU2



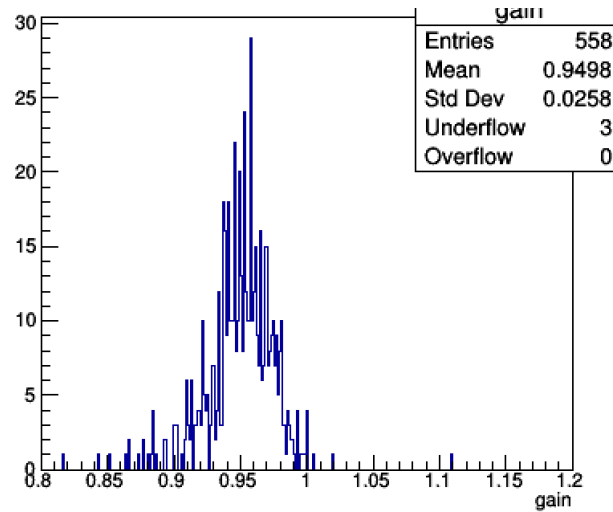
DU3



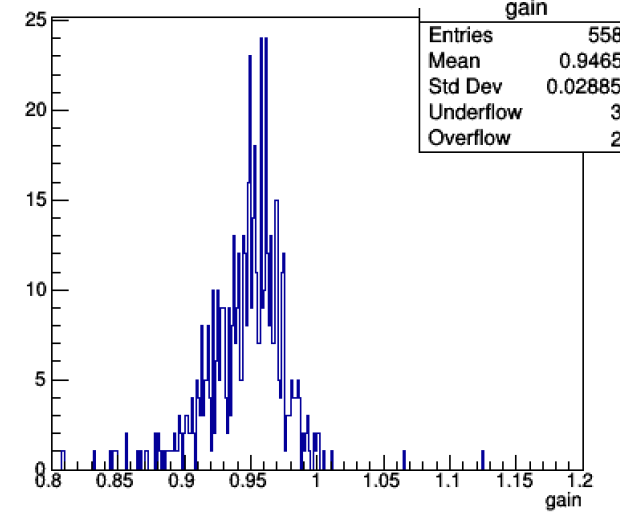
DU9



DU10



DU11

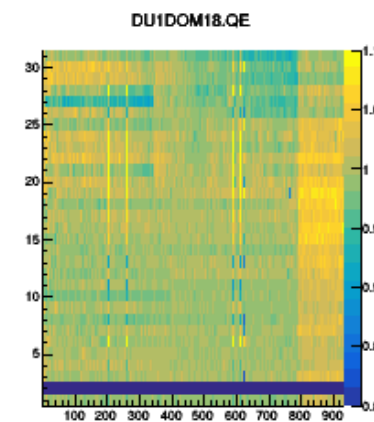
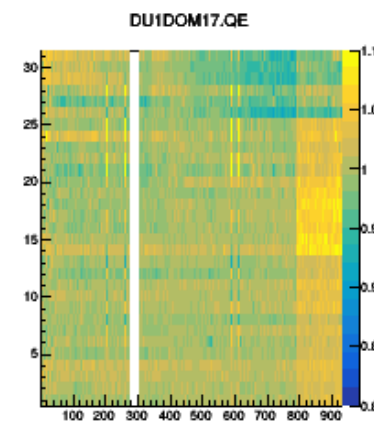
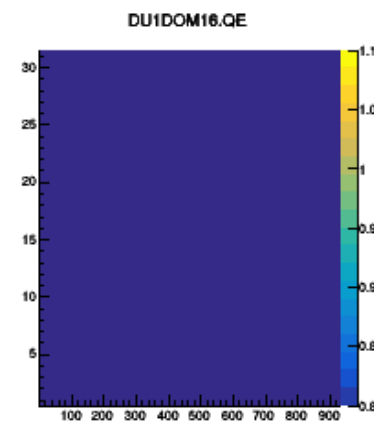
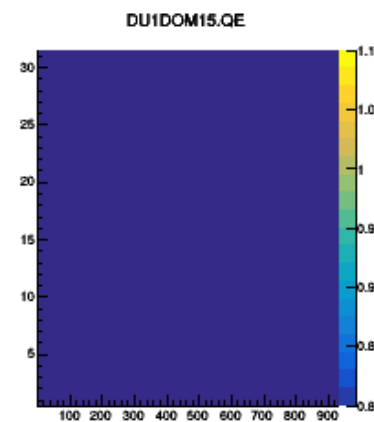
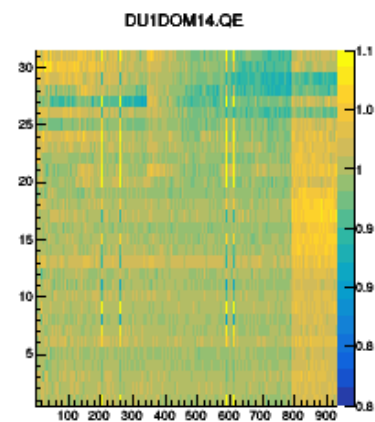
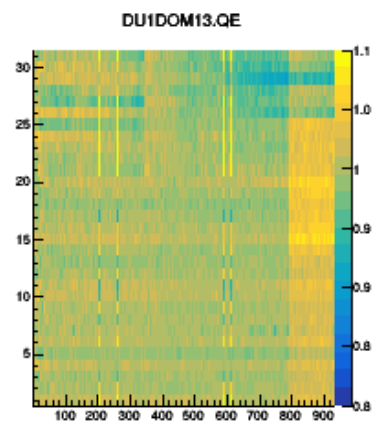
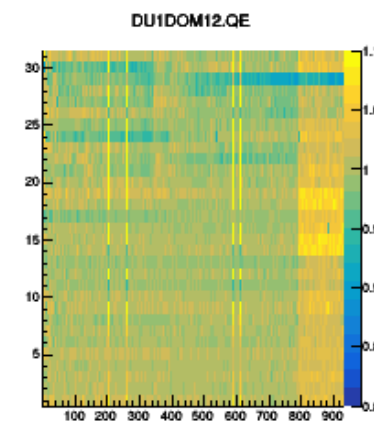
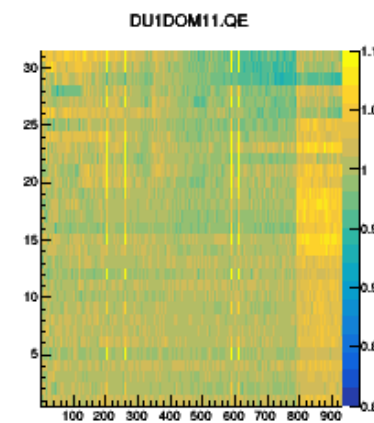
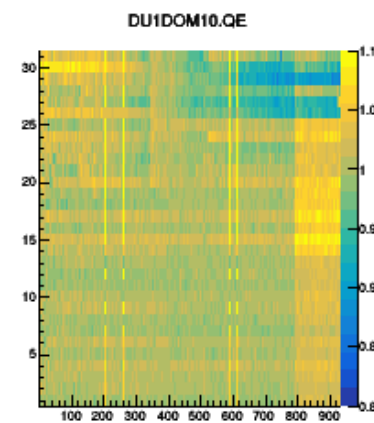
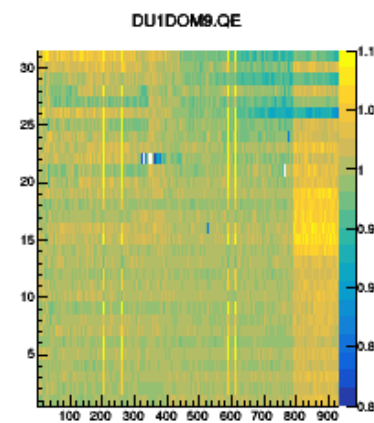
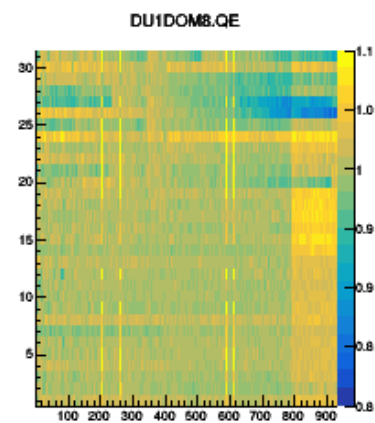
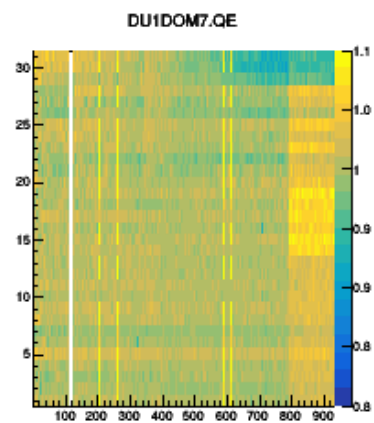
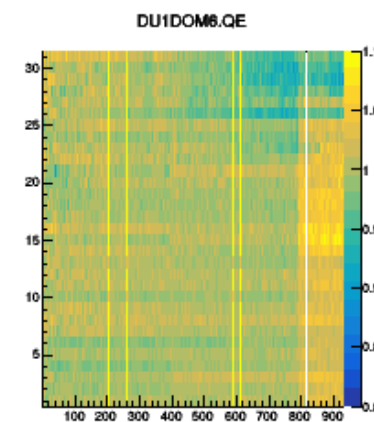
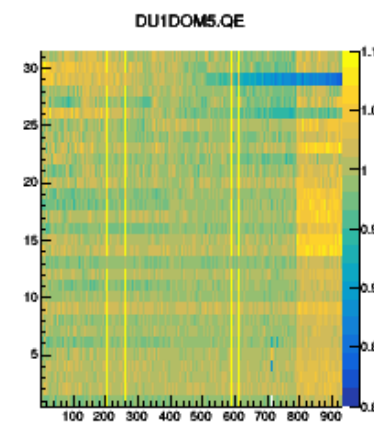
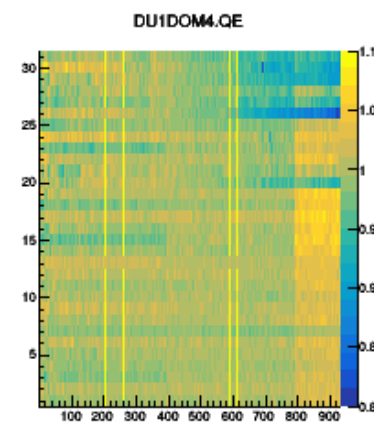
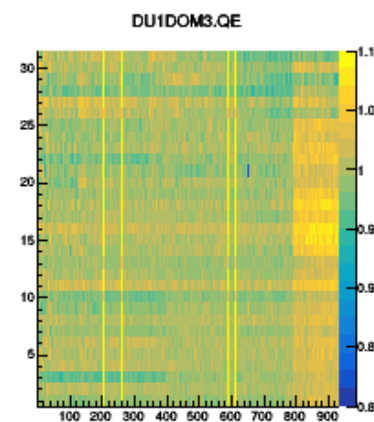
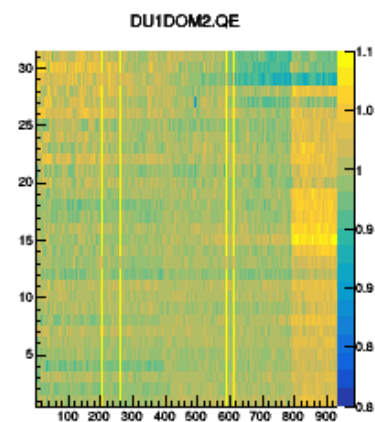
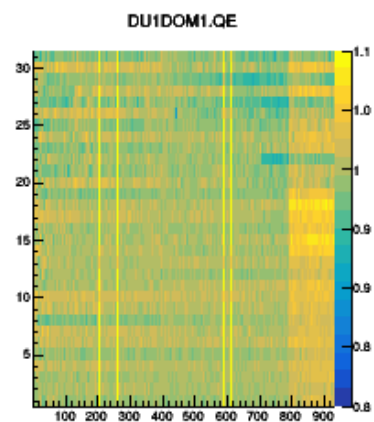


Gain distribution systematically around 0.95

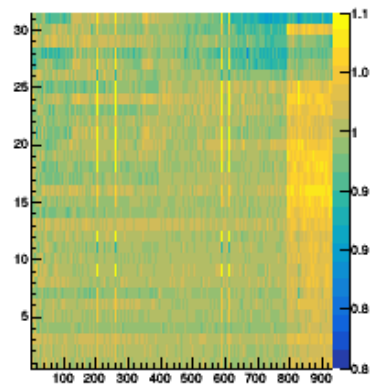
-> with fit options for ToT distribution restricting the x-range (0 -1.)  
as used in HV tuning this moves to 0.98

Difference to HV tuning:  
Evaluation on L1 data

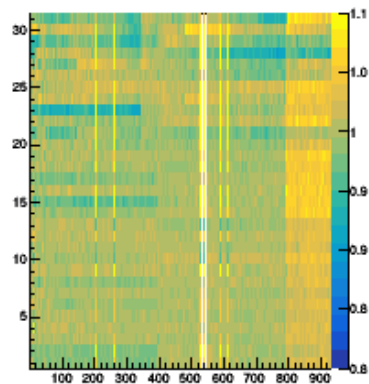
Backup



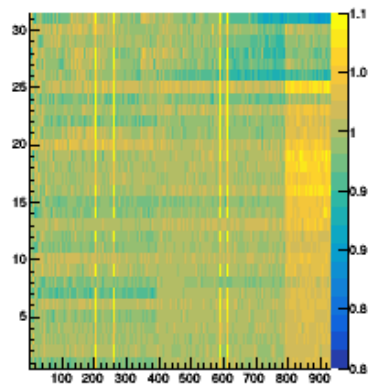
DU2DOM1.QE



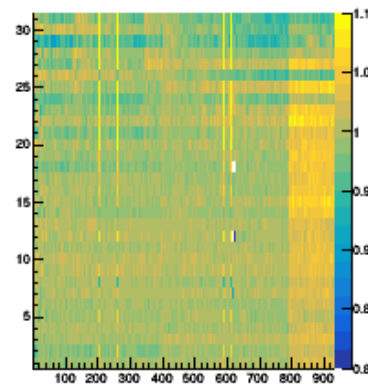
DU2DOM2.QE



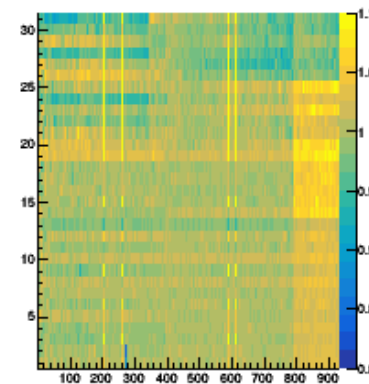
DU2DOM3.QE



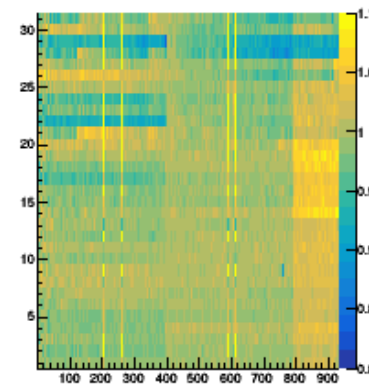
DU2DOM4.QE



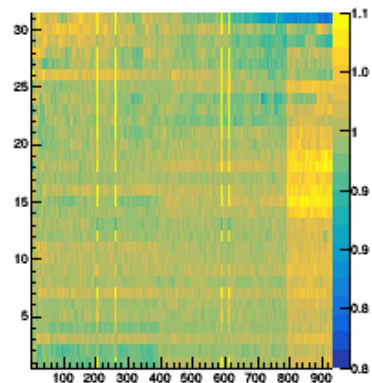
DU2DOM5.QE



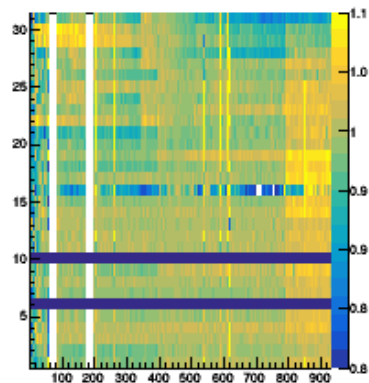
DU2DOM6.QE



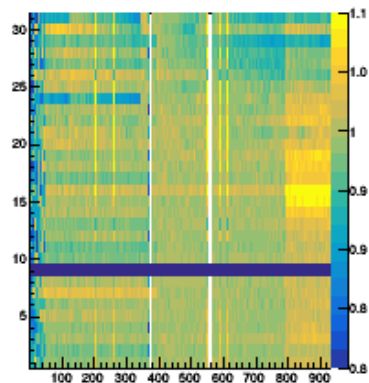
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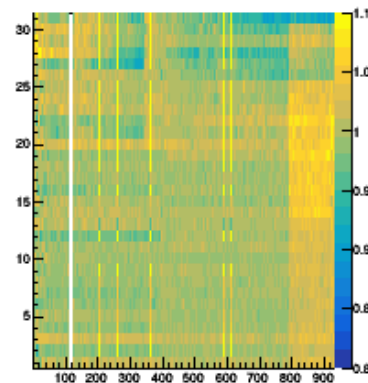
DU2DOM8.QE



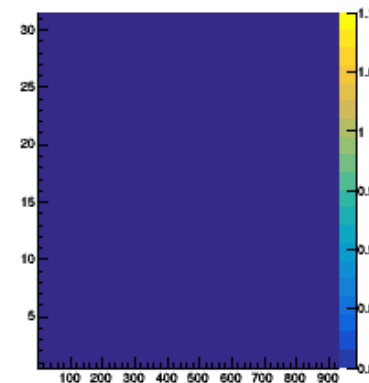
DU2DOM9.QE



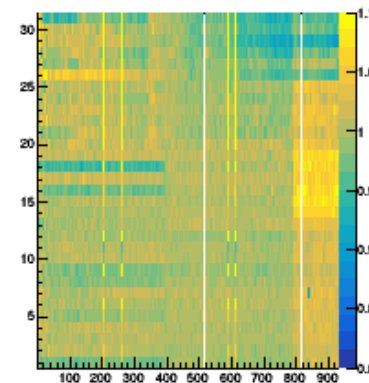
DU2DOM10.QE



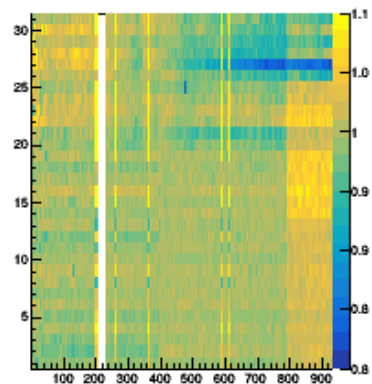
DU2DOM11.QE



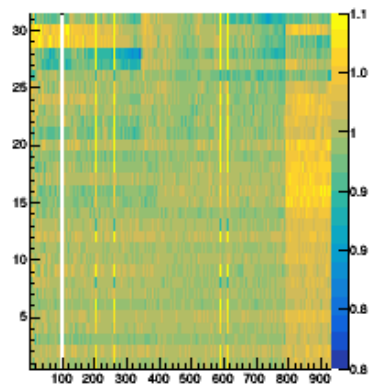
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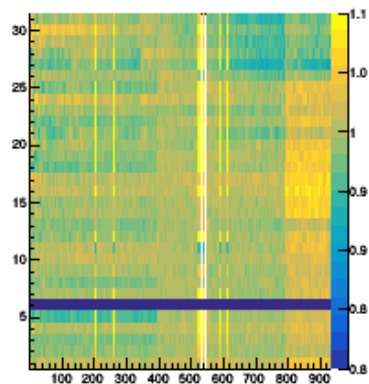
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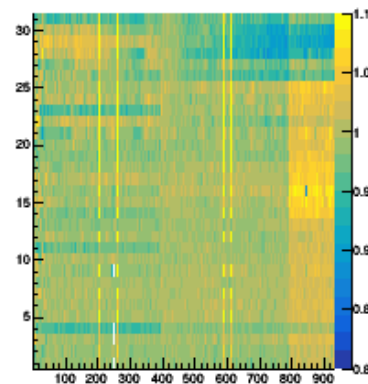
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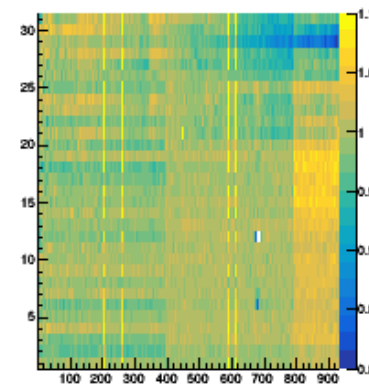
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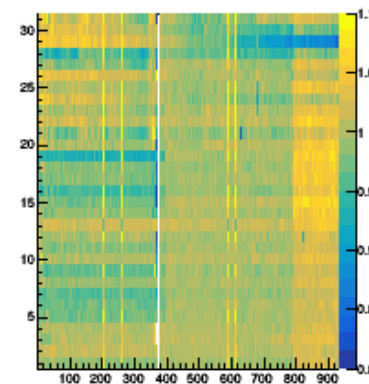
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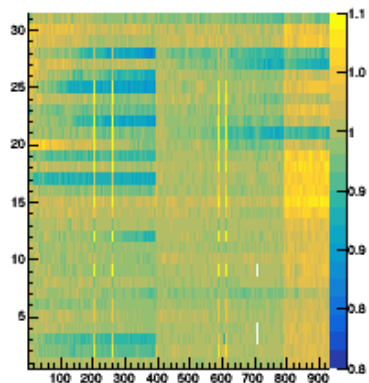
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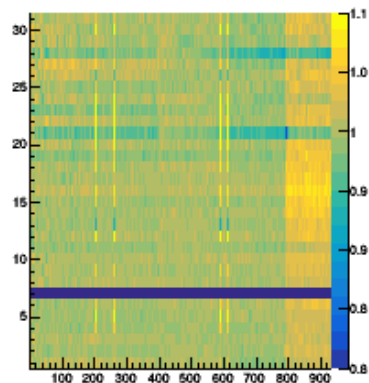
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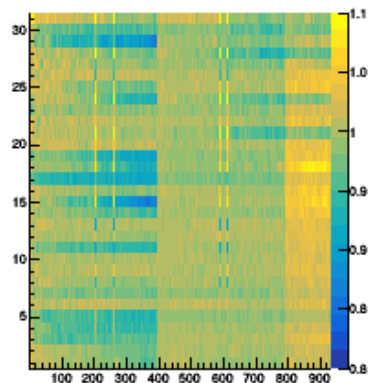
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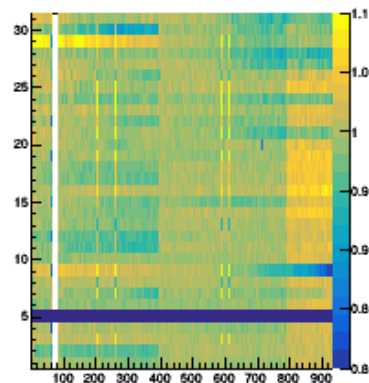
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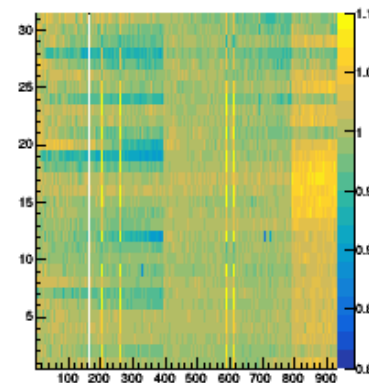
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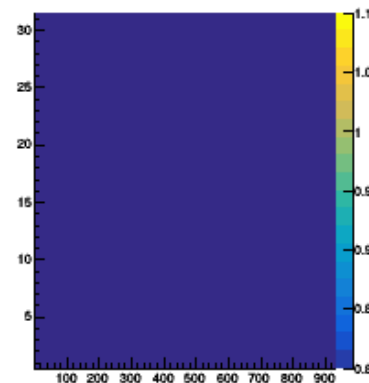
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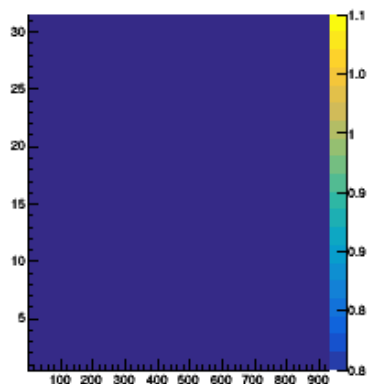
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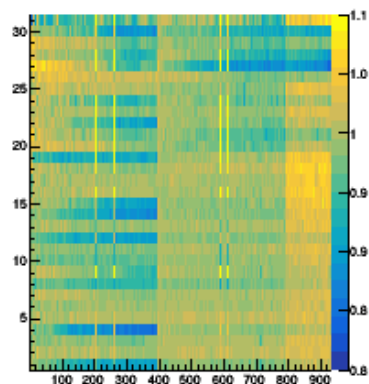
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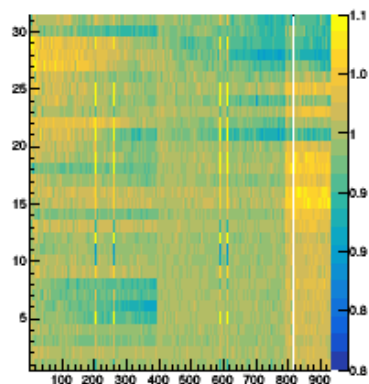
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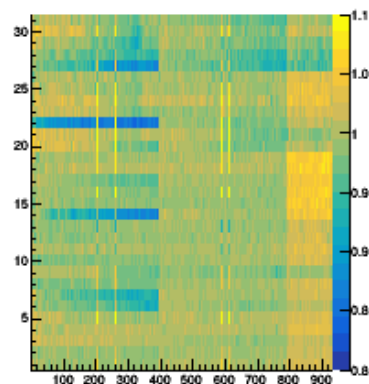
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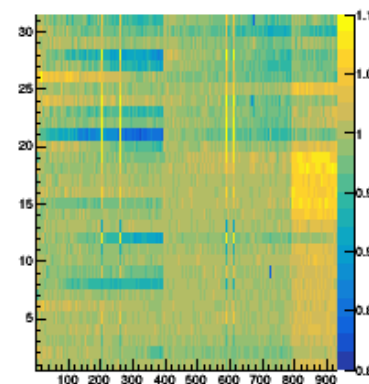
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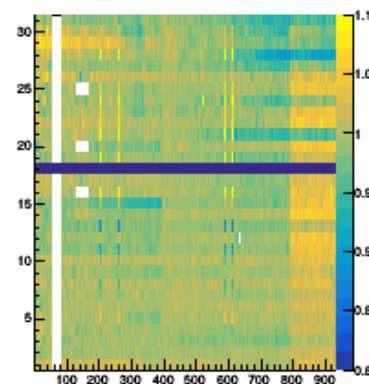
DU3DOM10.QE



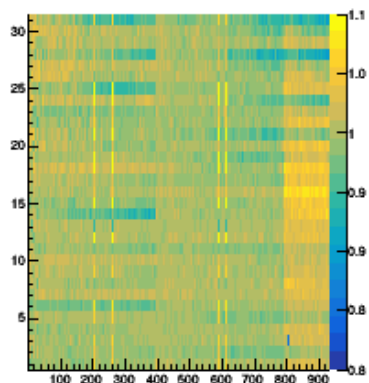
DU3DOM11.QE



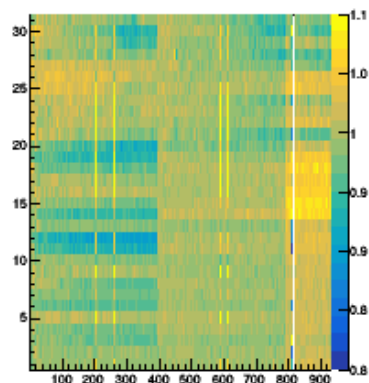
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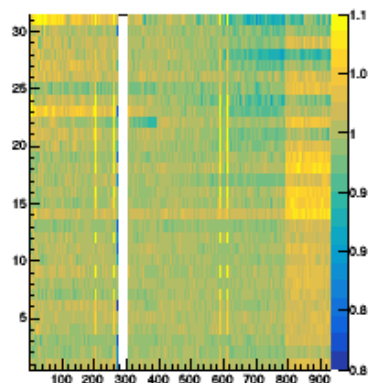
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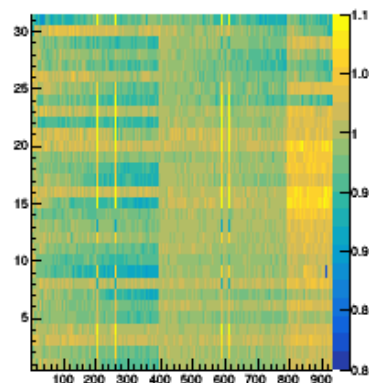
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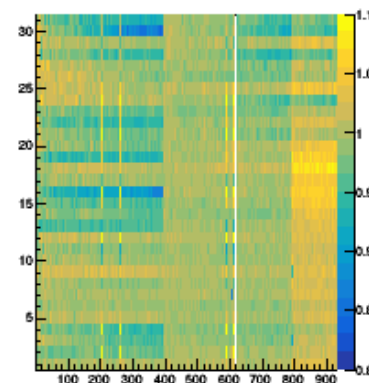
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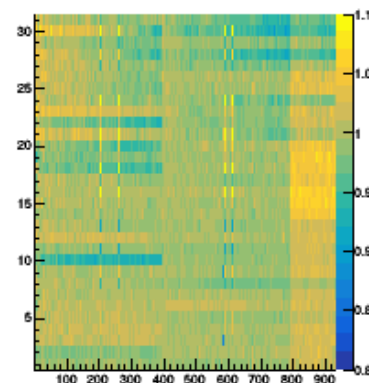
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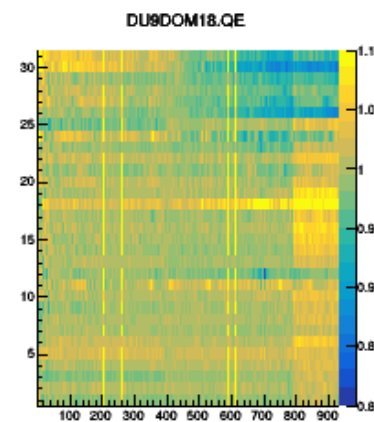
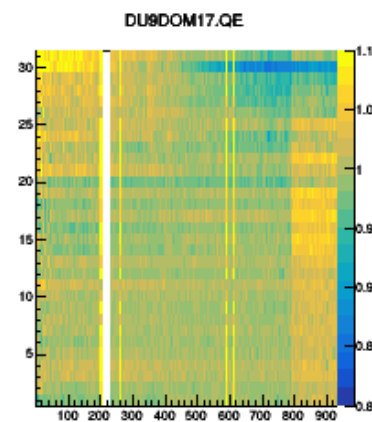
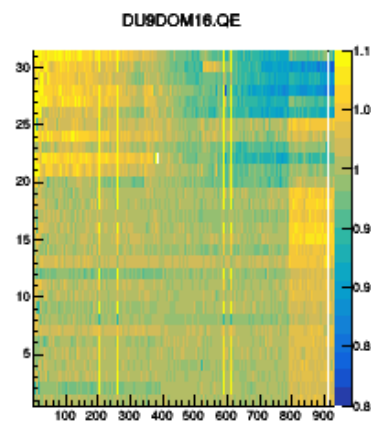
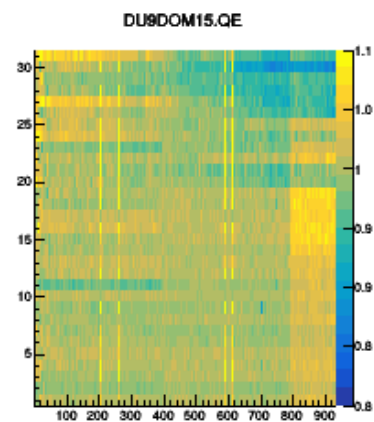
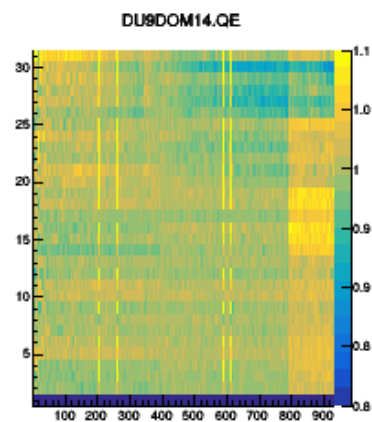
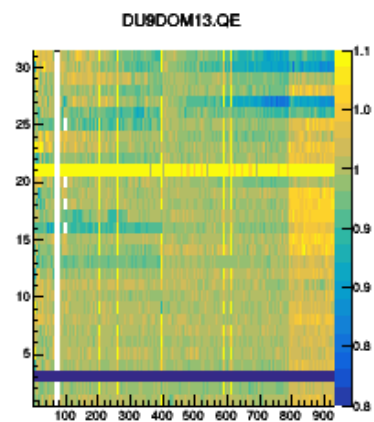
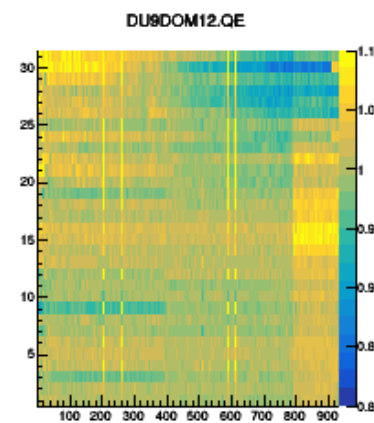
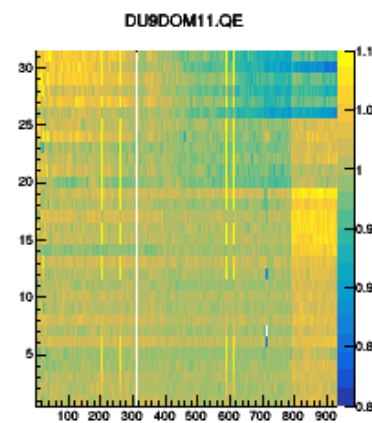
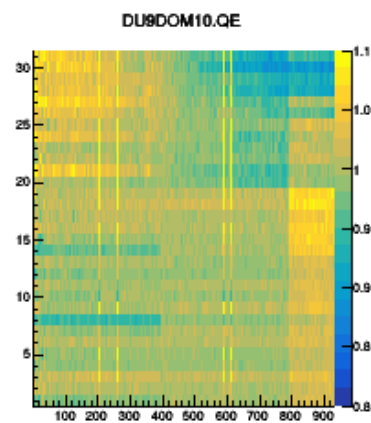
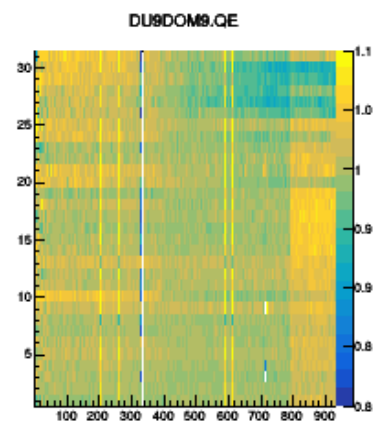
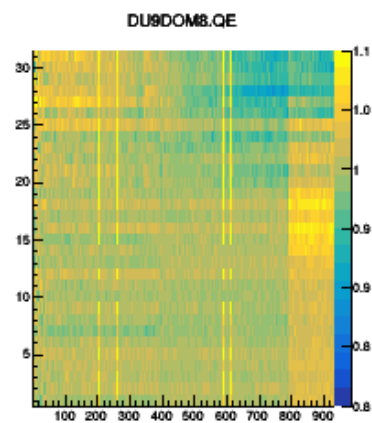
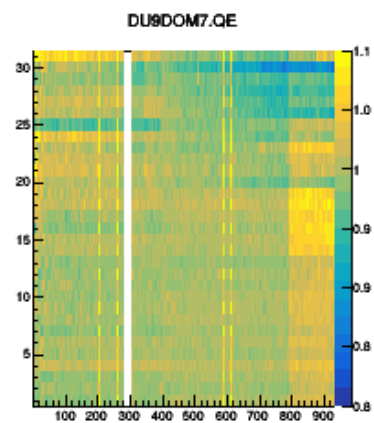
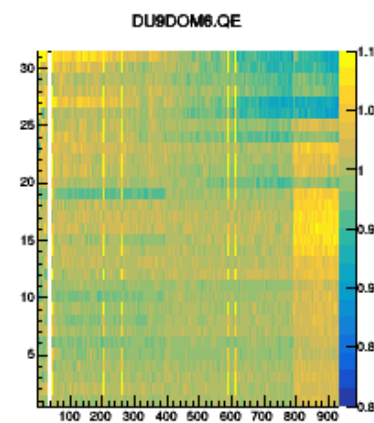
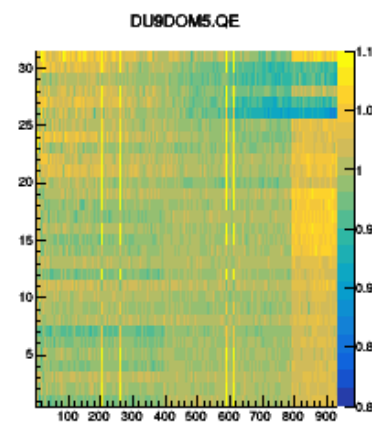
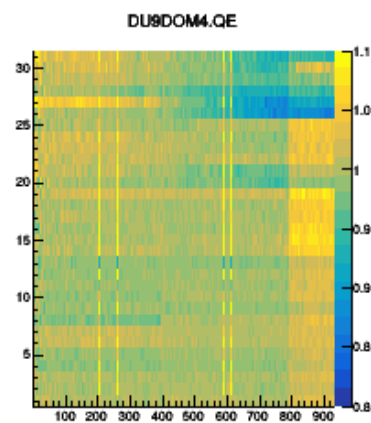
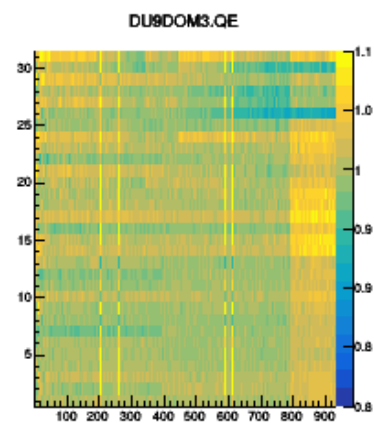
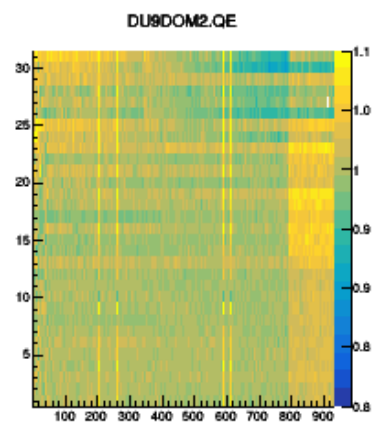
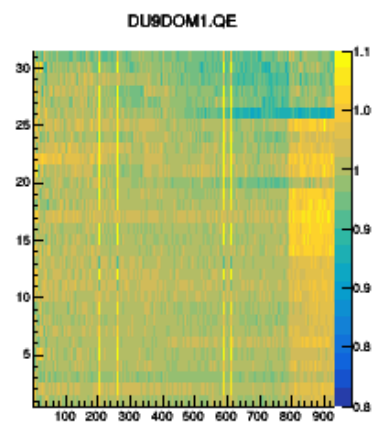


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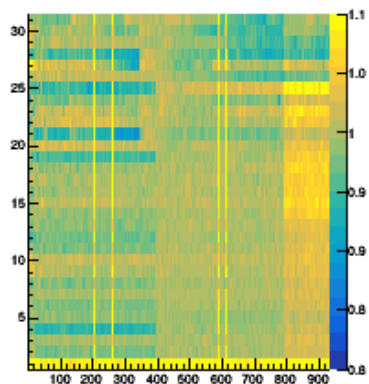
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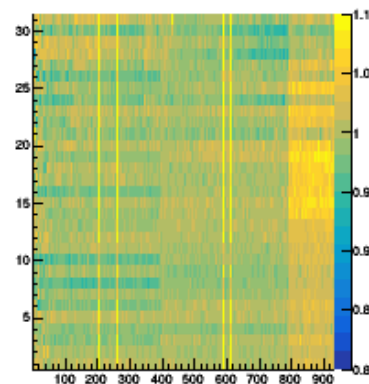




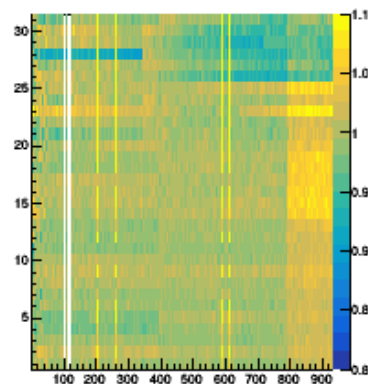
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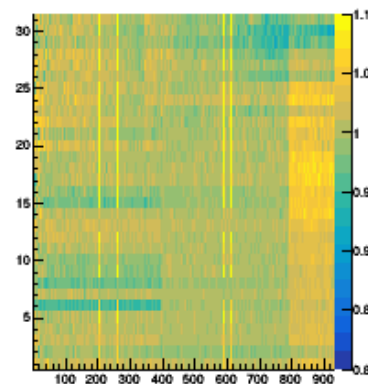
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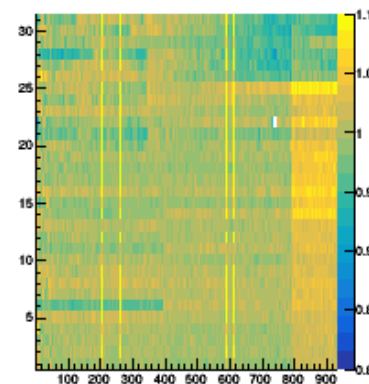
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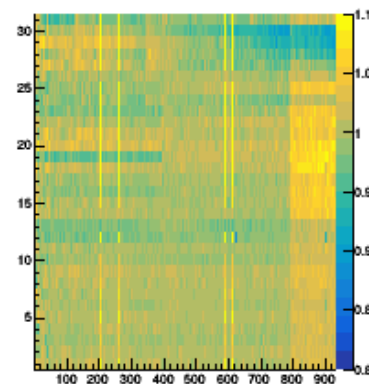
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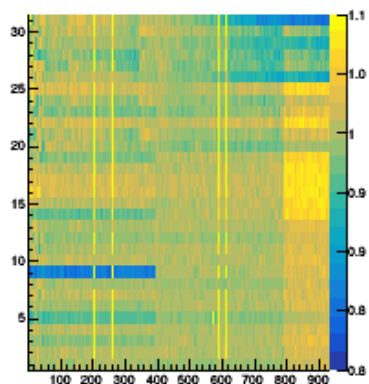
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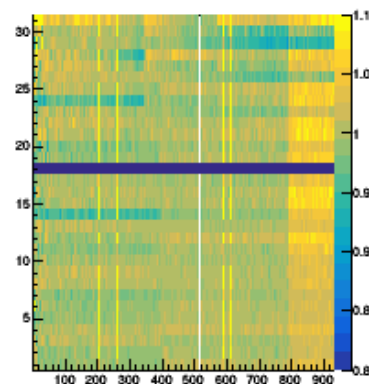
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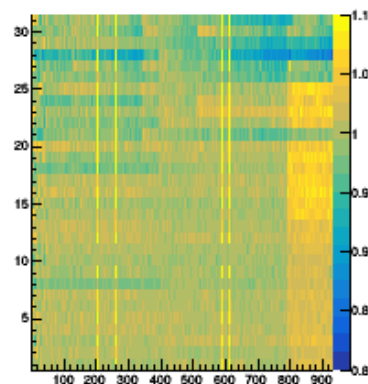
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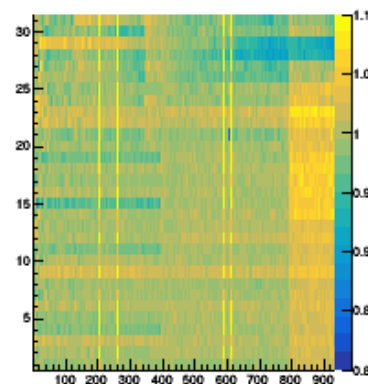
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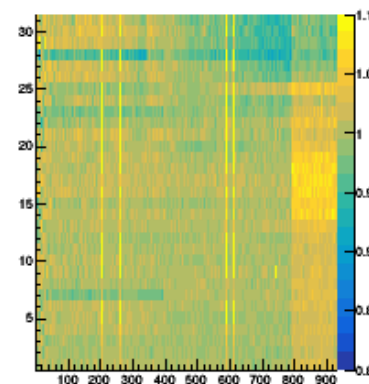
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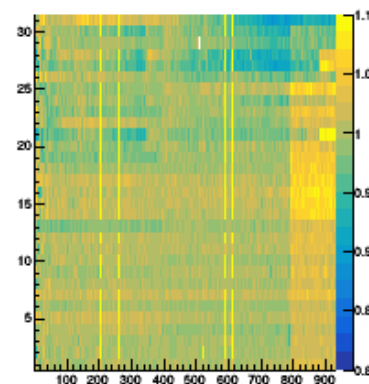
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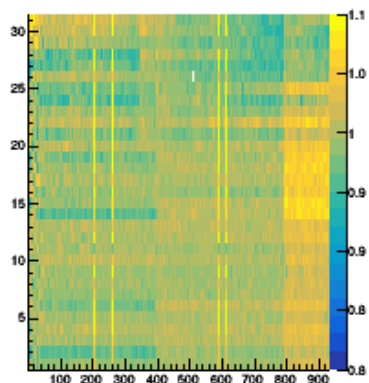
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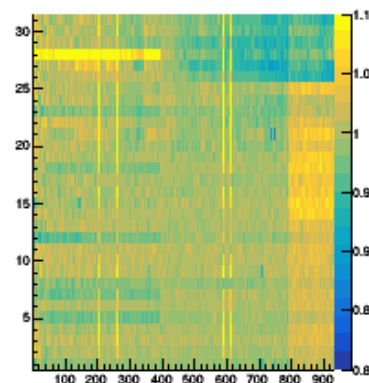
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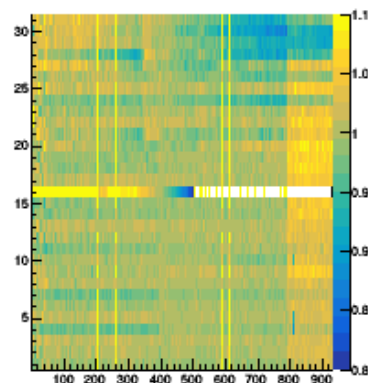
DU10DOM13.QE



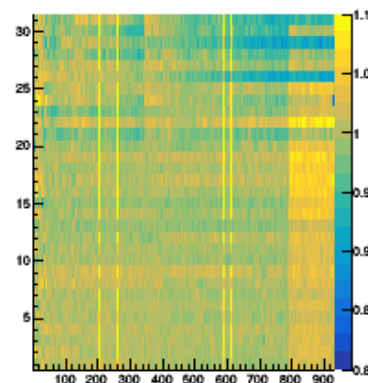
DU10DOM14.QE



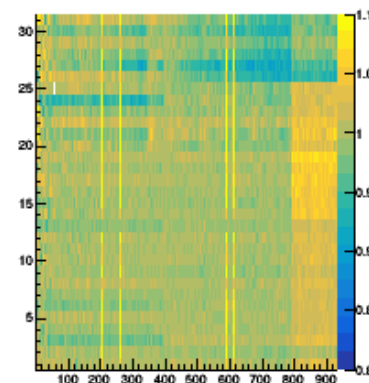
DU10DOM15.QE



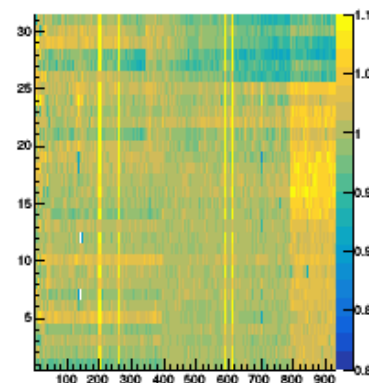
DU10DOM16.QE



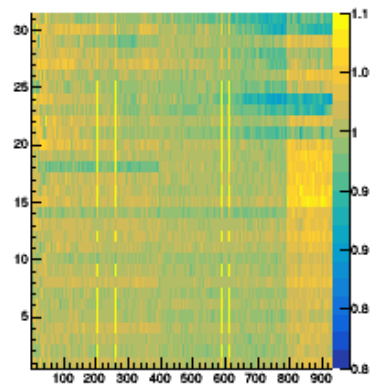
DU10DOM17.QE



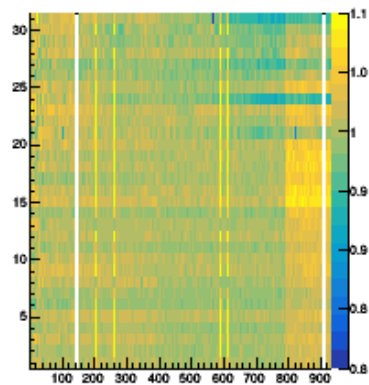
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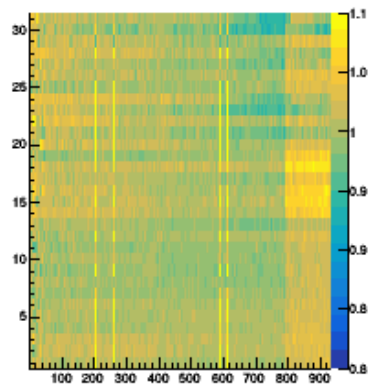
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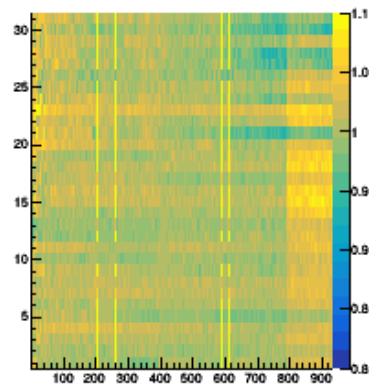
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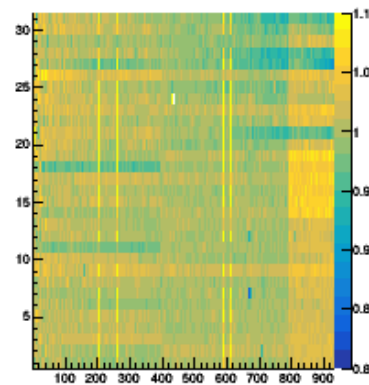
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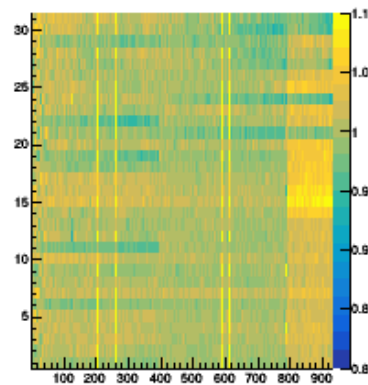
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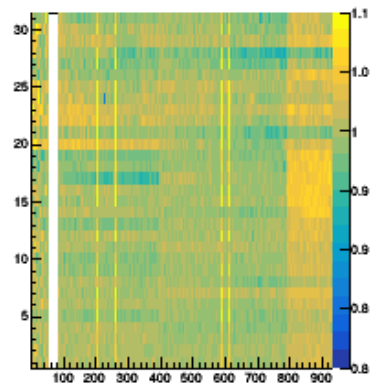
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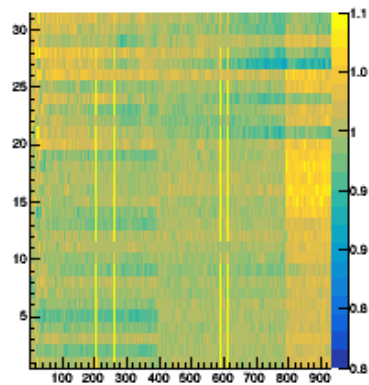
DU11DOM6.QE



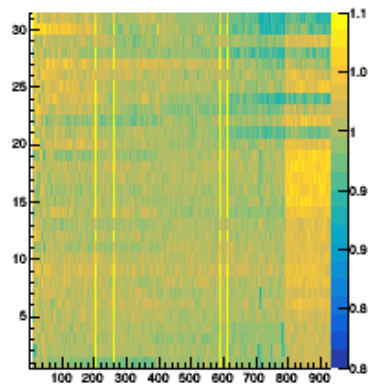
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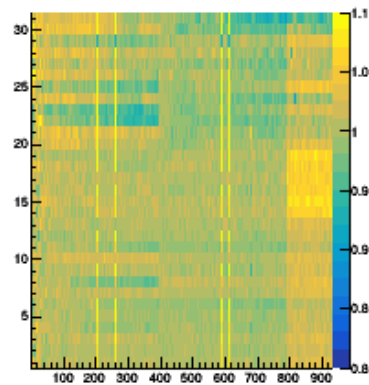
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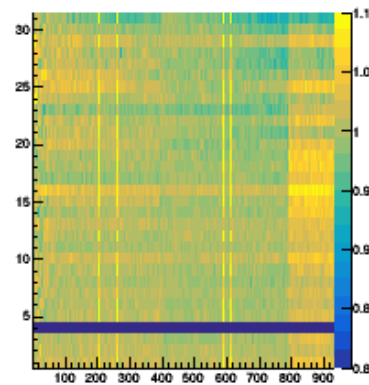
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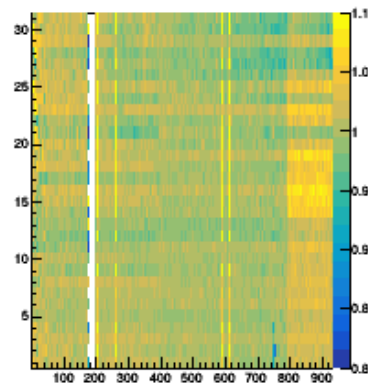
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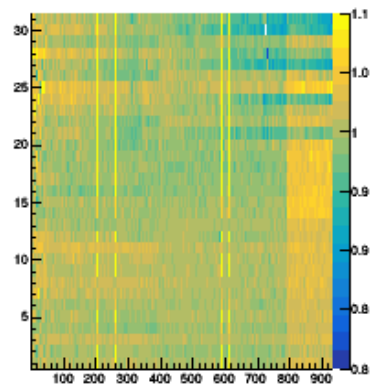
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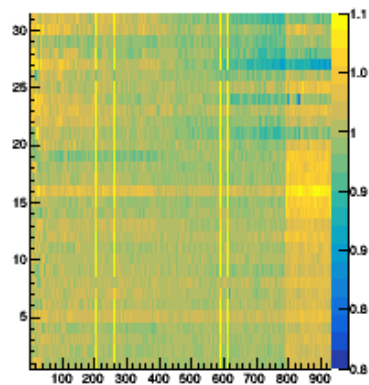
DU11DOM12.QE



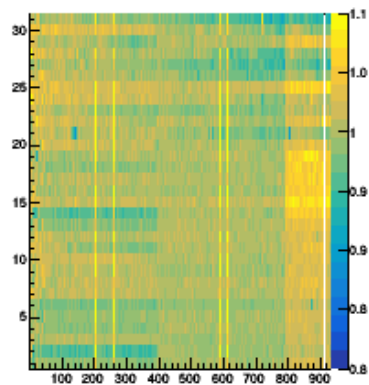
DU11DOM13.QE



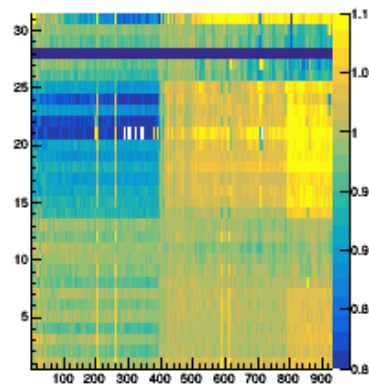
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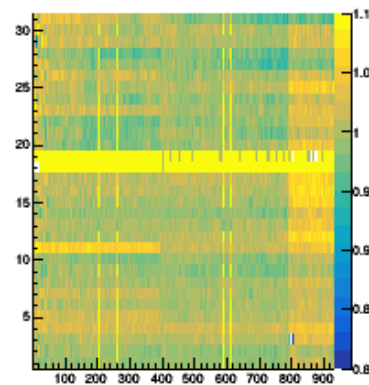
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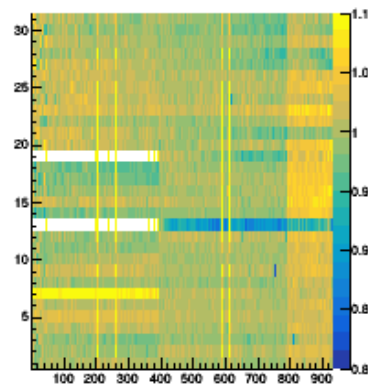
DU11DOM16.QE



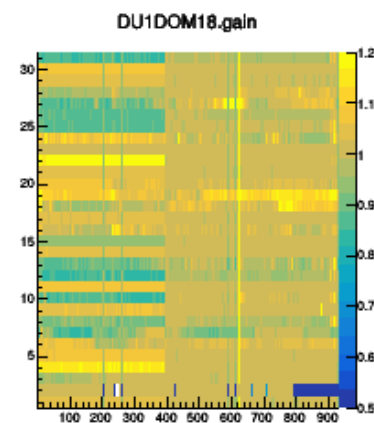
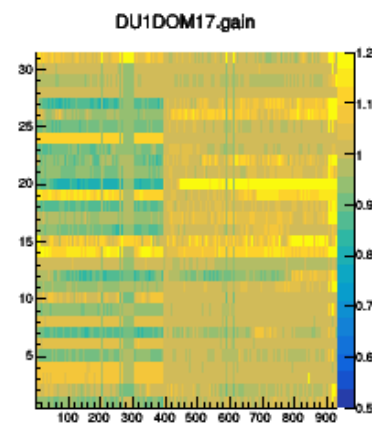
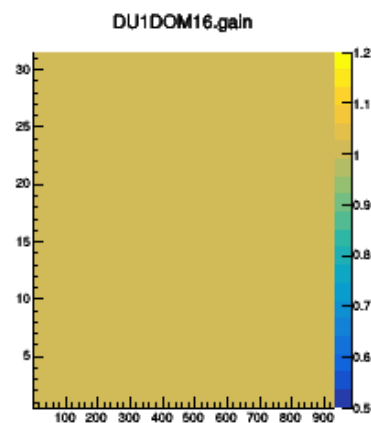
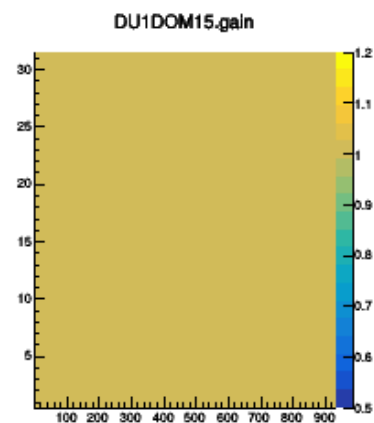
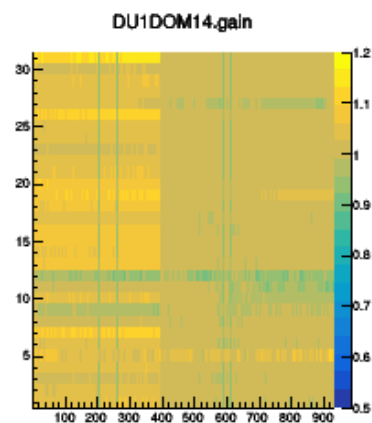
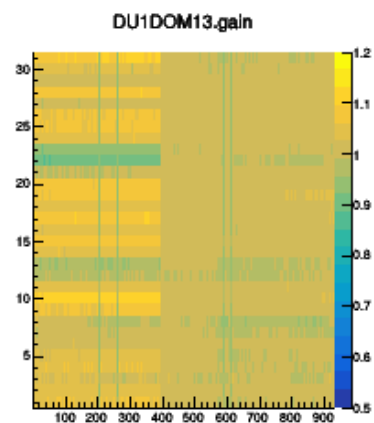
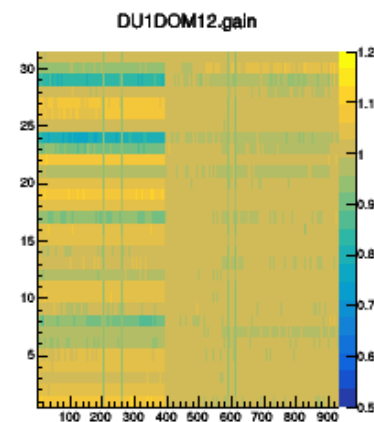
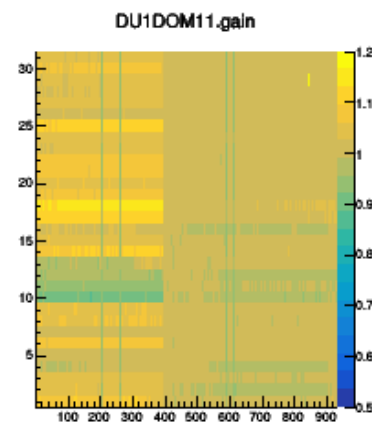
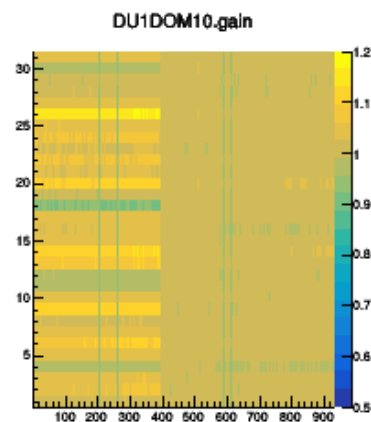
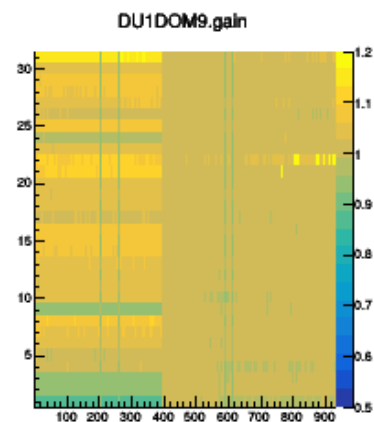
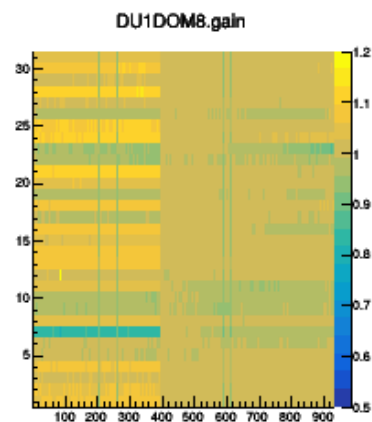
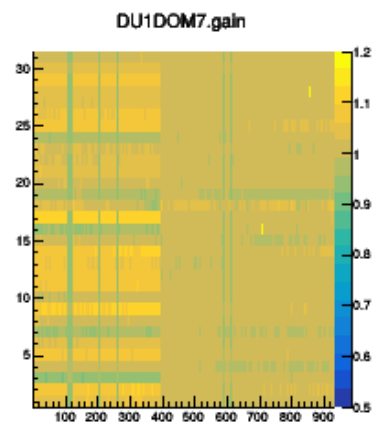
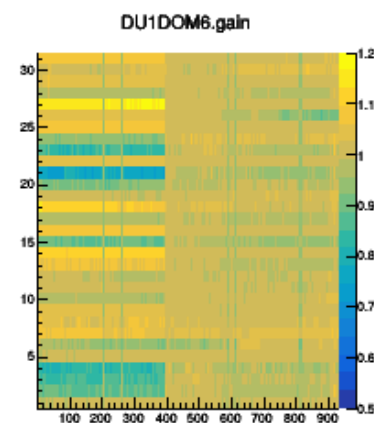
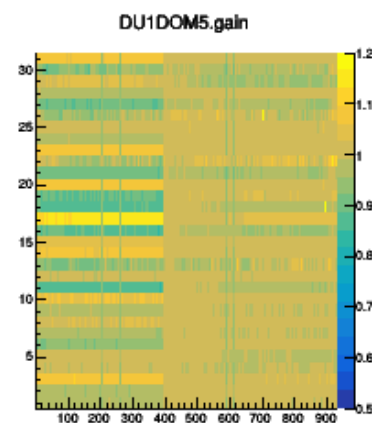
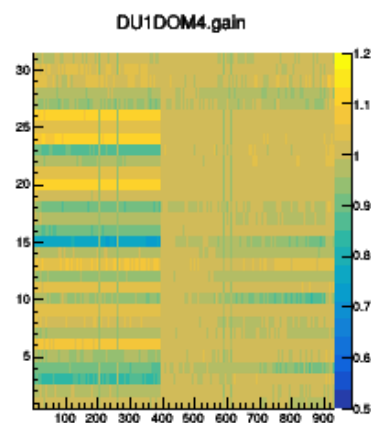
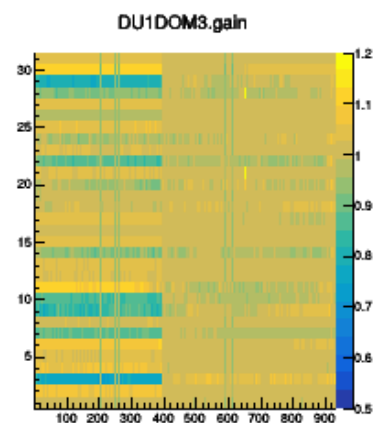
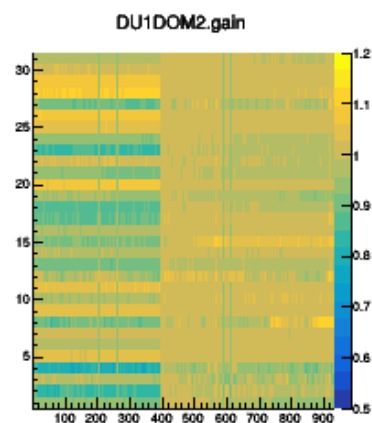
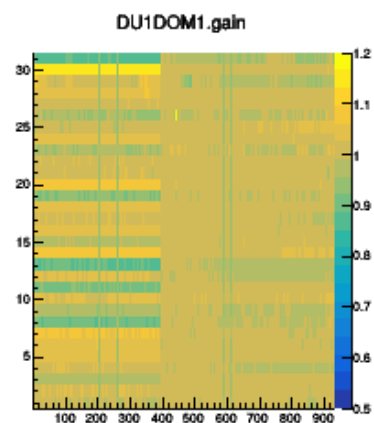
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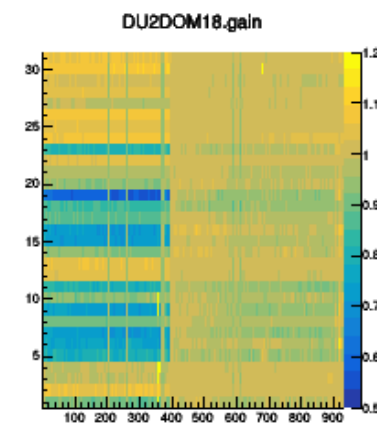
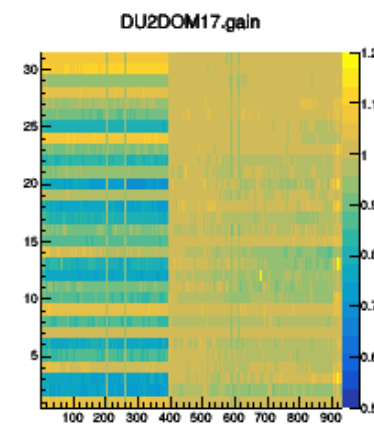
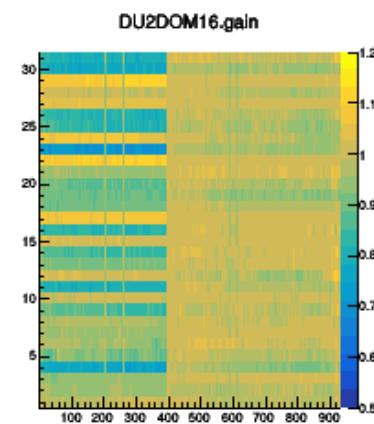
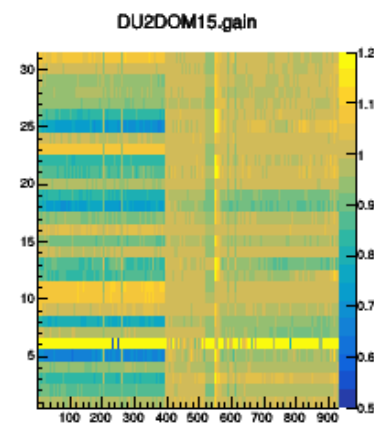
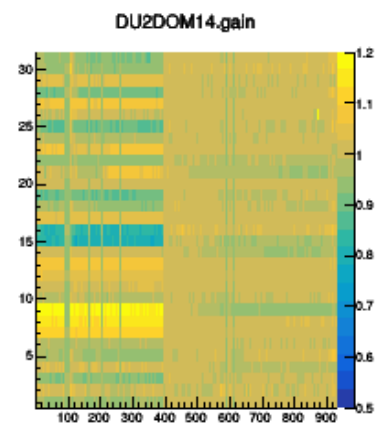
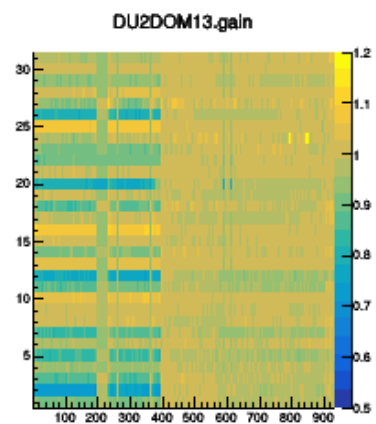
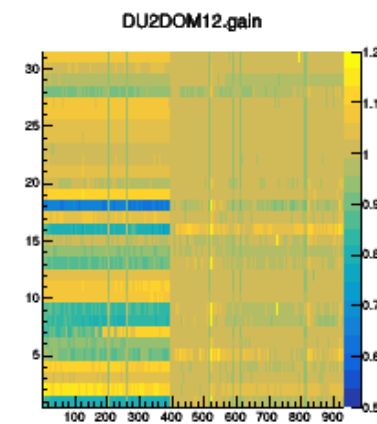
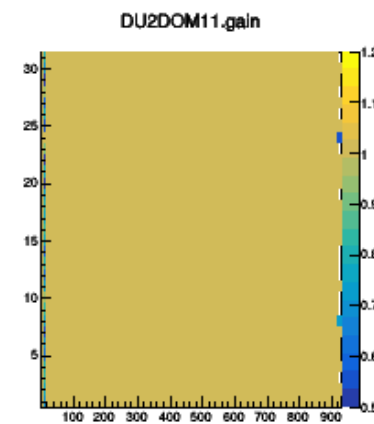
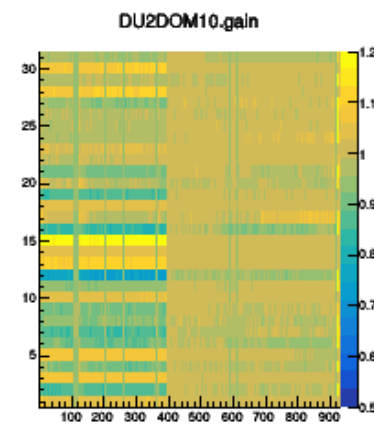
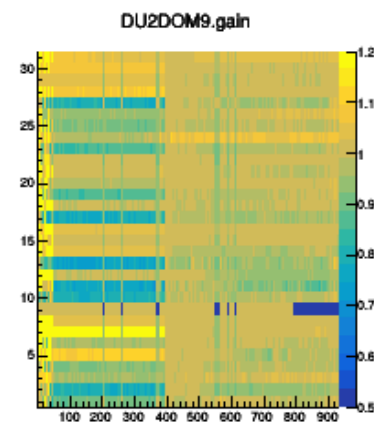
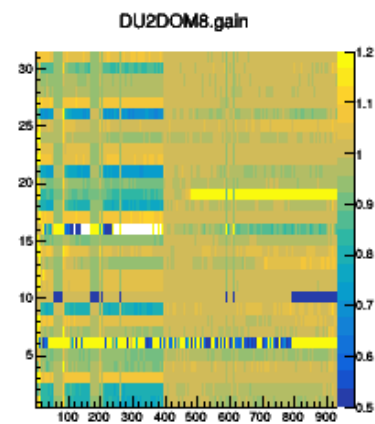
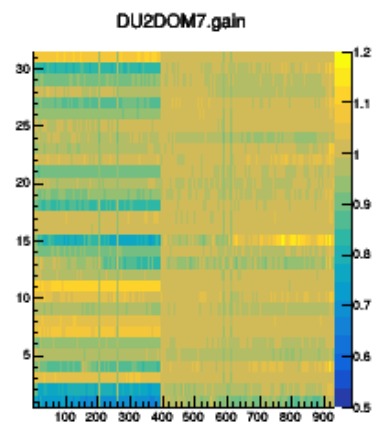
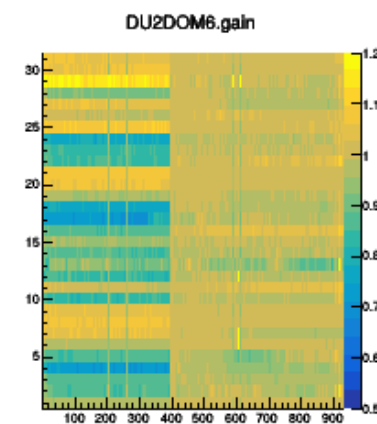
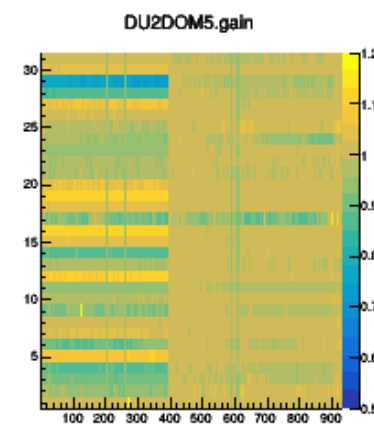
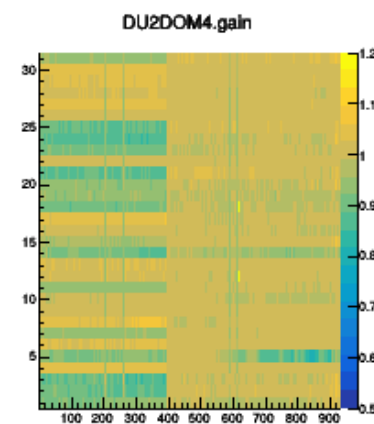
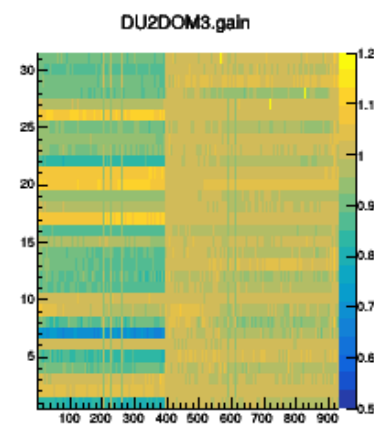
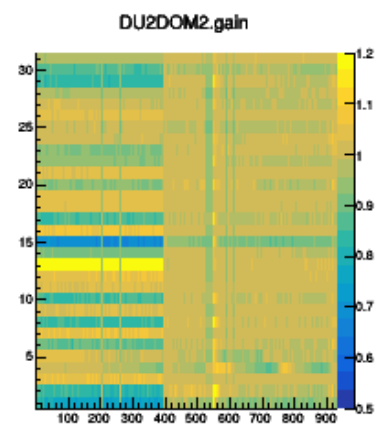
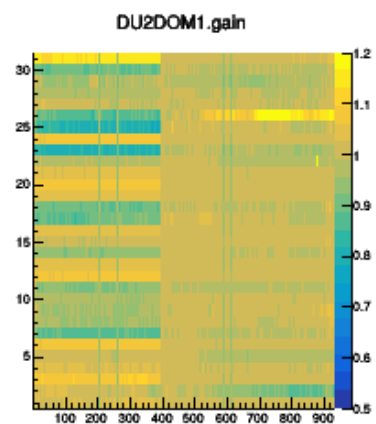


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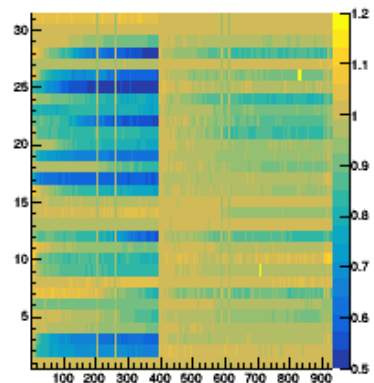




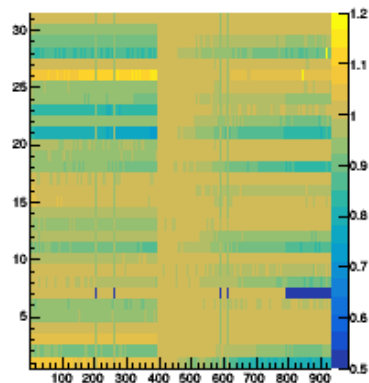




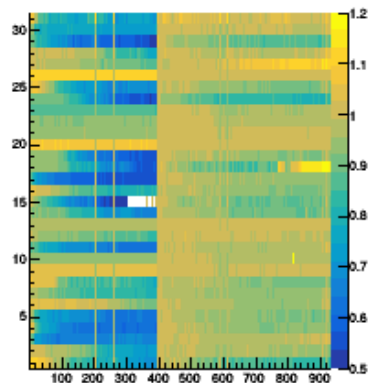
DU3DOM1.gain



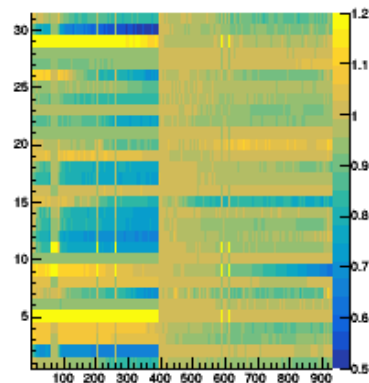
DU3DOM2.gain



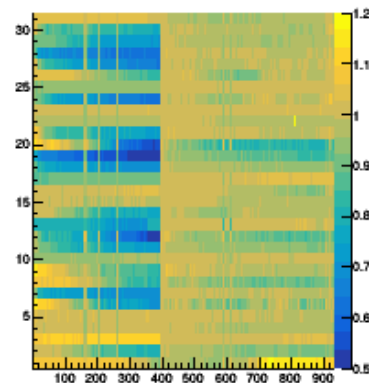
DU3DOM3.gain



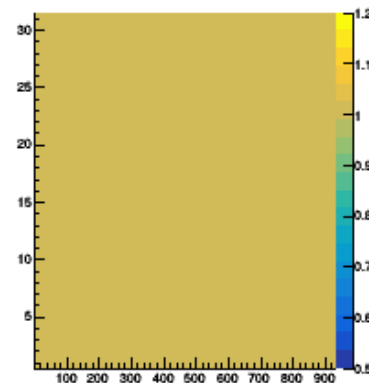
DU3DOM4.gain



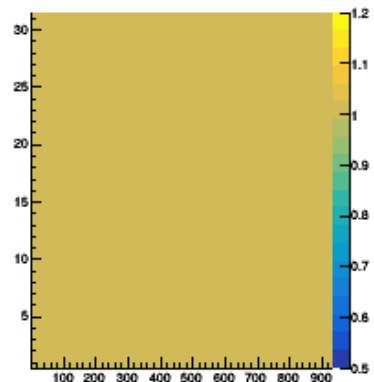
DU3DOM5.gain



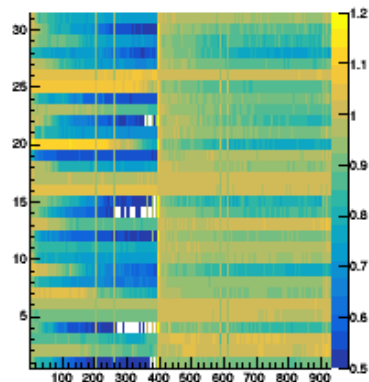
DU3DOM6.gain



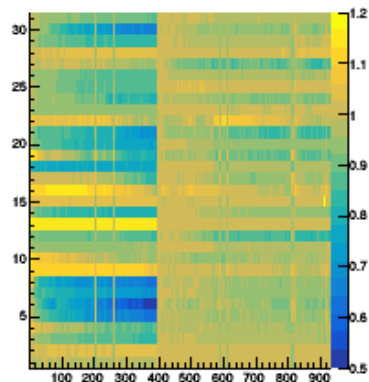
DU3DOM7.gain



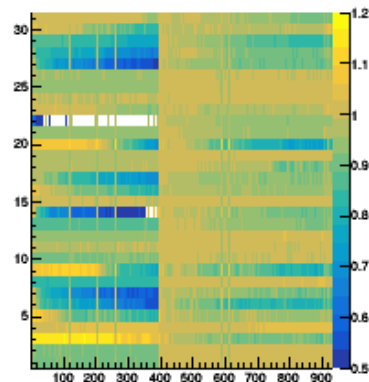
DU3DOM8.gain



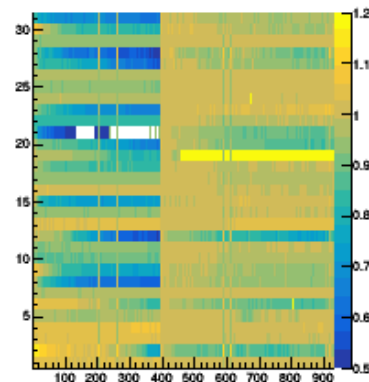
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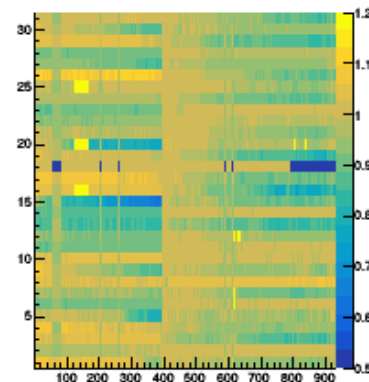
DU3DOM10.gain



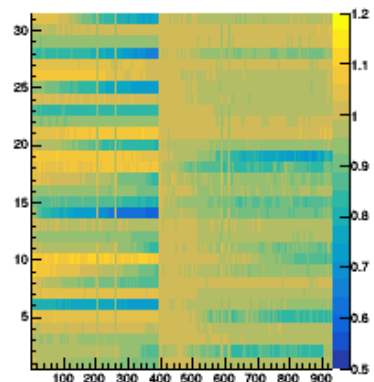
DU3DOM11.gain



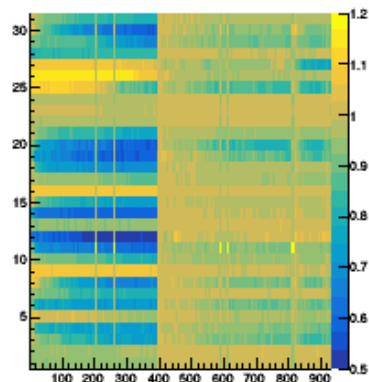
DU3DOM12.gain



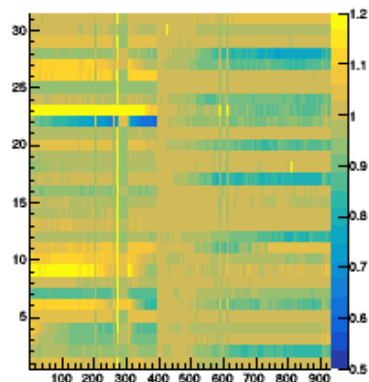
DU3DOM13.gain



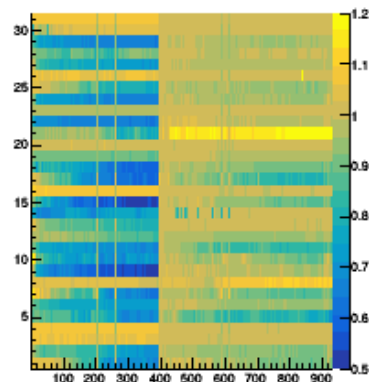
DU3DOM14.gain



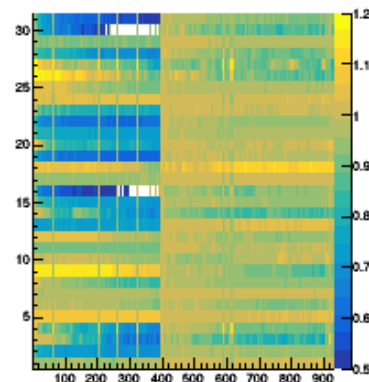
DU3DOM15.gain



DU3DOM16.gain



DU3DOM17.gain



DU3DOM18.gain

