FCalPulse.
Effect of Oxygen Contamination on Pulse Behavior

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Data 2022

Experimental data from eos:

/eos/atlas/atlascerngroupdisk/larg-upgrade/phase-2/FCalPulse/data/2022/

Code to get the necessary variables from Savin (gitlab link).

Compared runs details								
run w/o O_2 cont.	# event in Paper logbook	Entries From files	run w/ O_2 cont.	# event in Paper logbook	Entries From files	Source in		
						HV FC mid.	HV FC out.	HV SC
1162	**30353**	31252	1189	19092	19092	+250	+250	+250
1163	**30403**	30990	1192	**17733**	18757	+250	+250	-800
1170	21329	21329	1203	17183	17183	-250	-250	-800

FCal and Shower Cal

Shower Cal front

FCal

Shower Cal rear

Electron beam

front   middle   back
tube segments
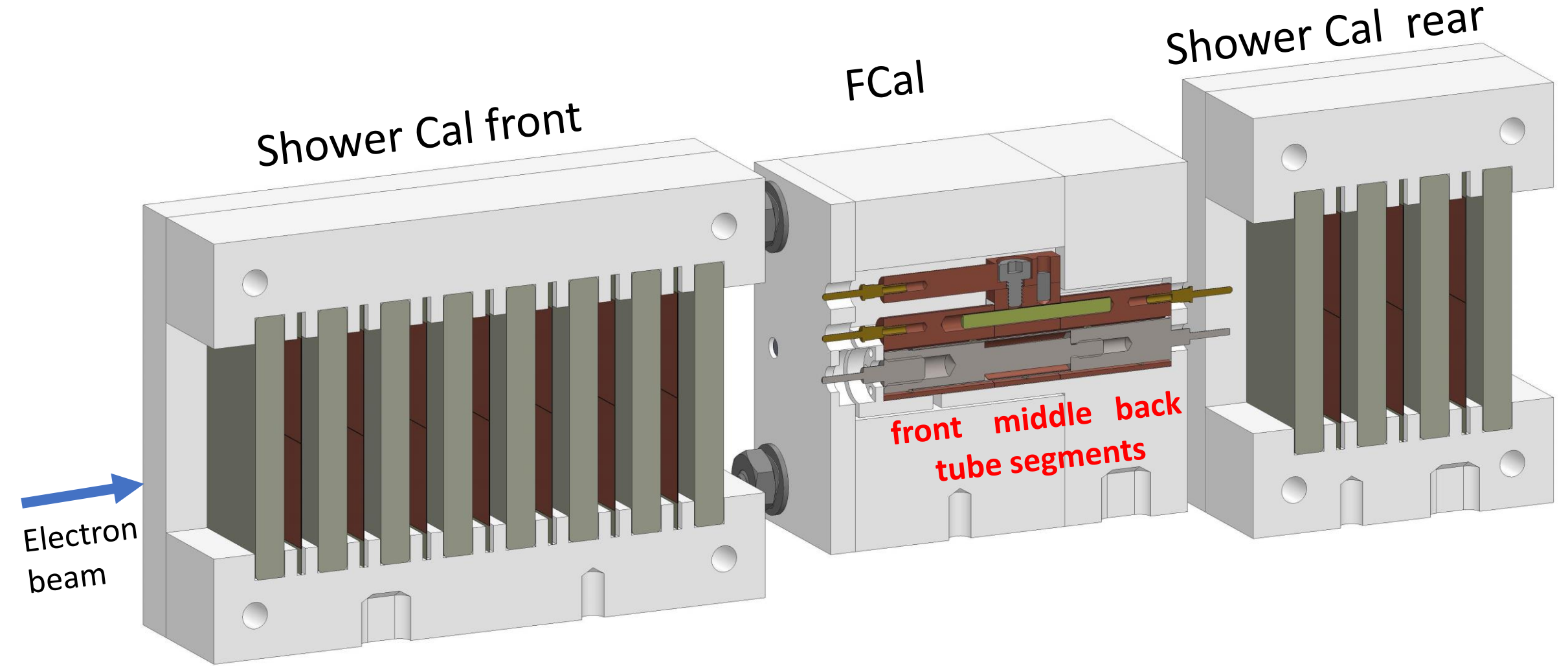
Shower Calorimeter Quadrants
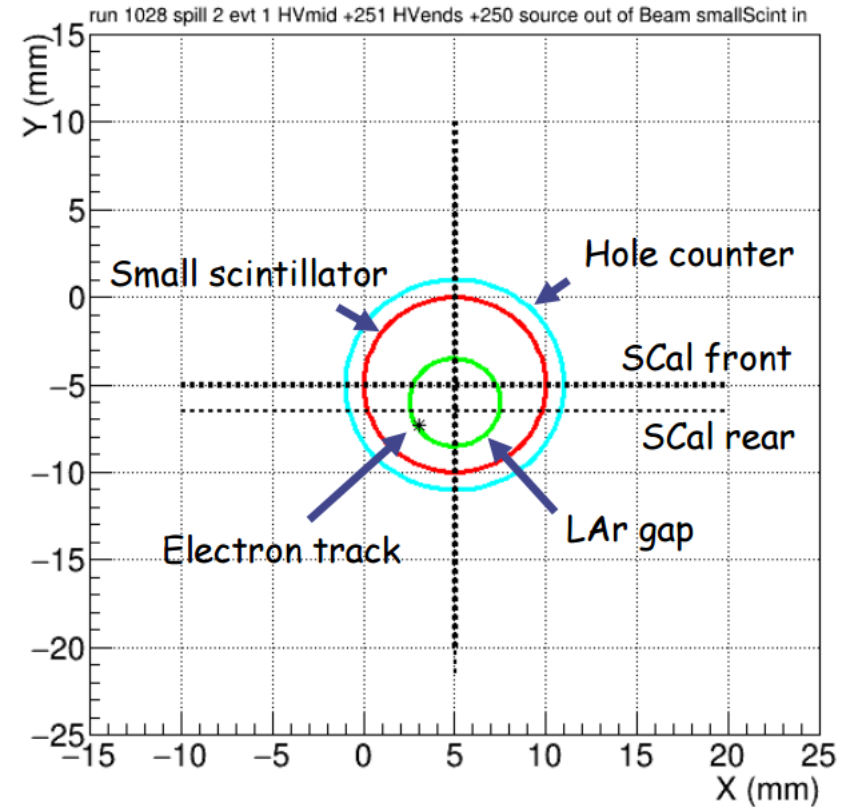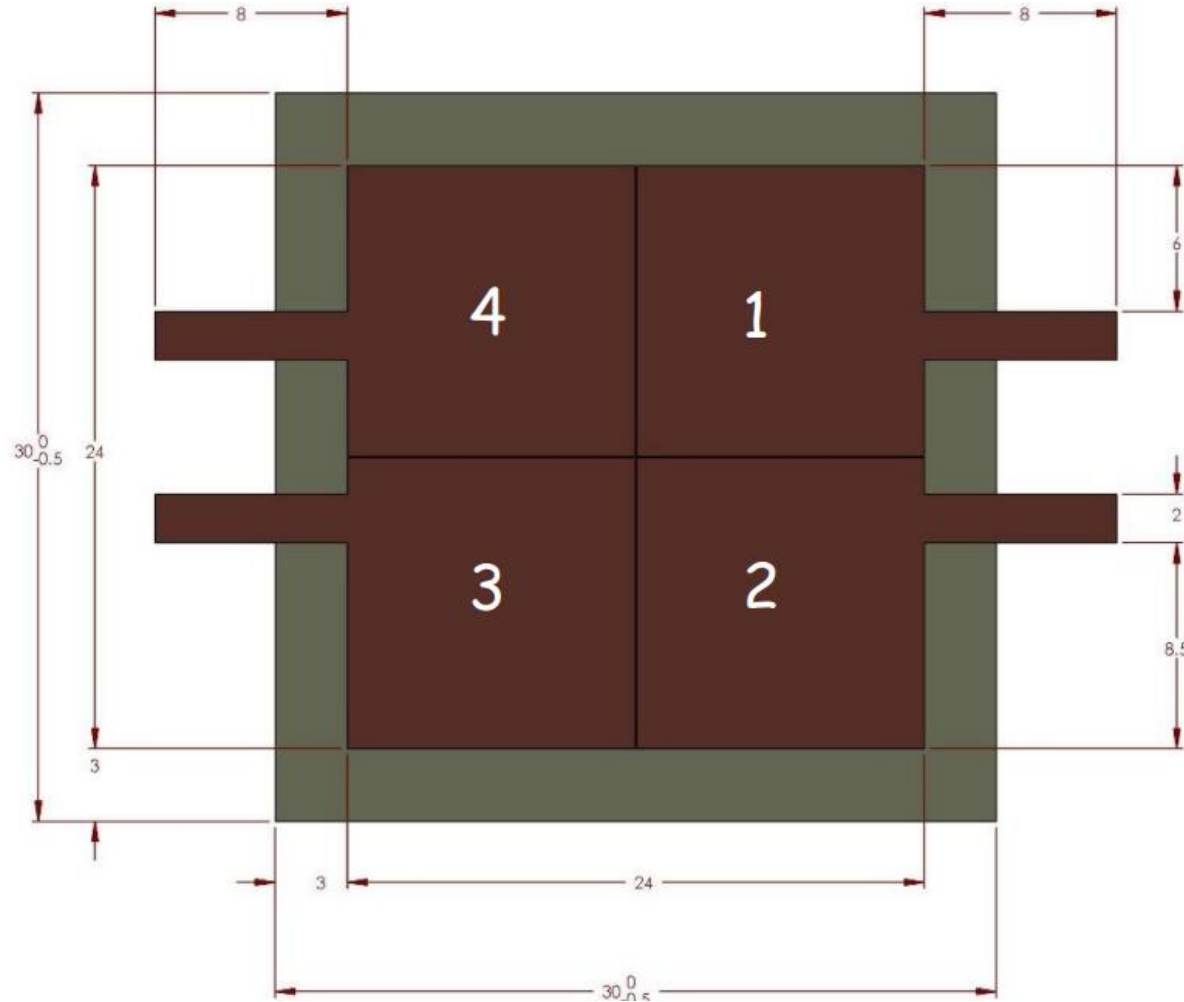
Comparison of run1162 w/ run1189

HV (FC mid, FC out, SC): +250, +250, +250

Spectrum in SCal **front** Quadrants
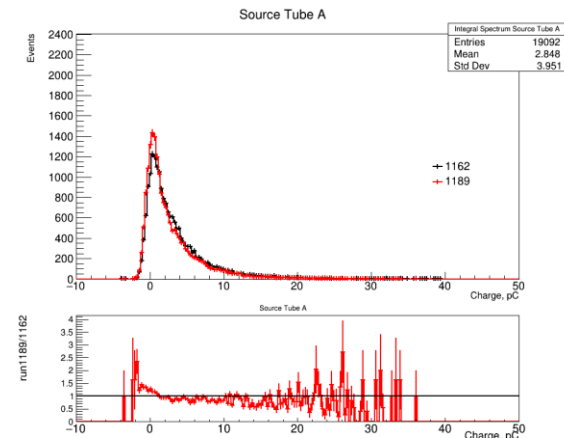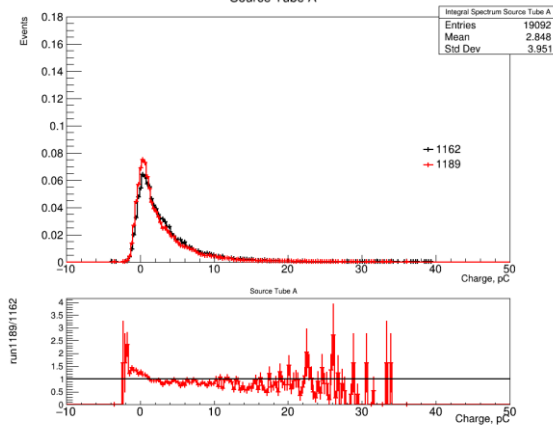
Spectrum in SCal rear Quadrants
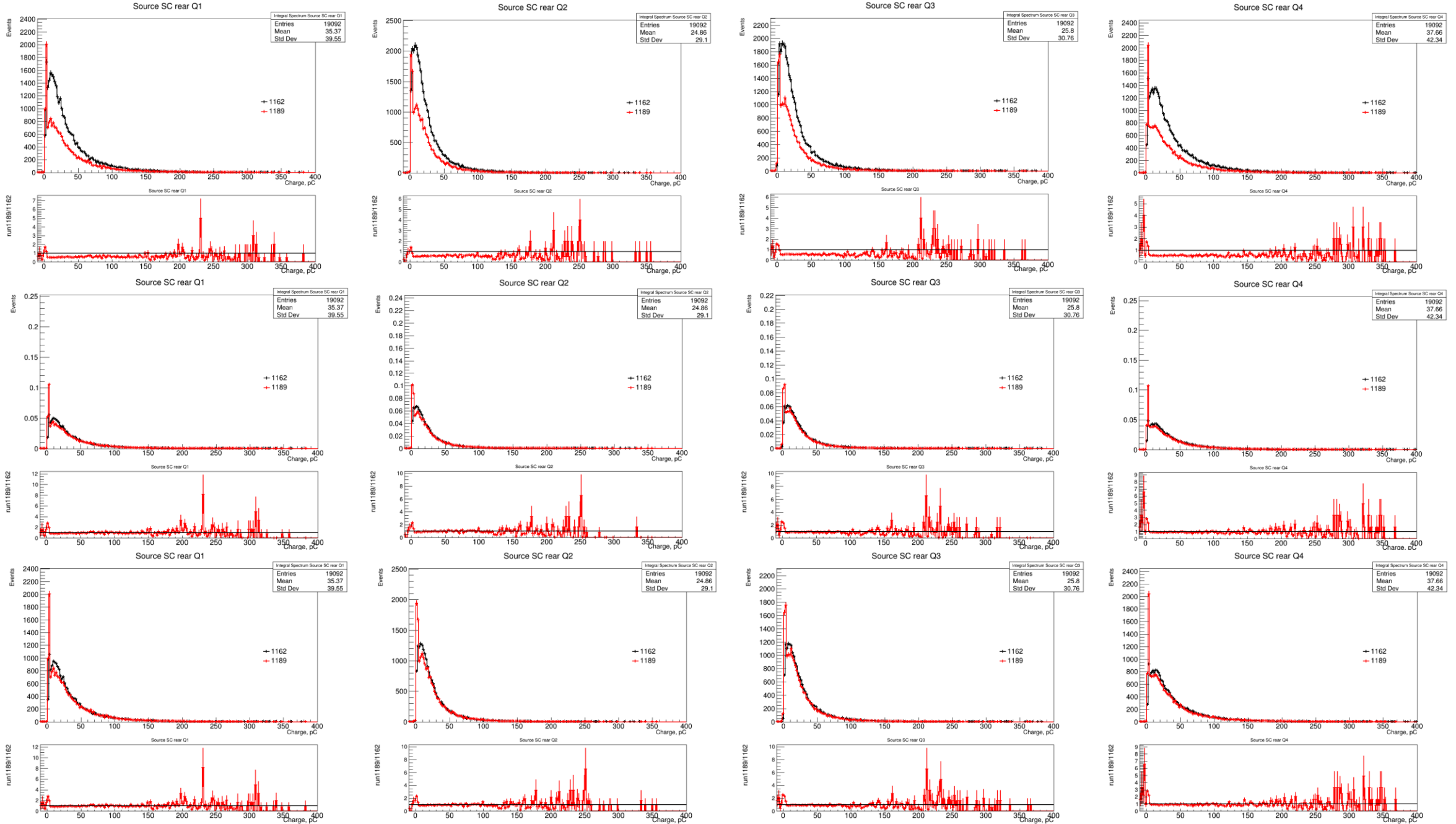
Spectrum in FCal Tubes

Tube A
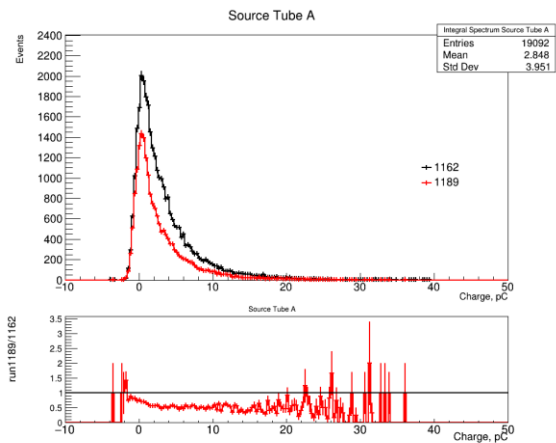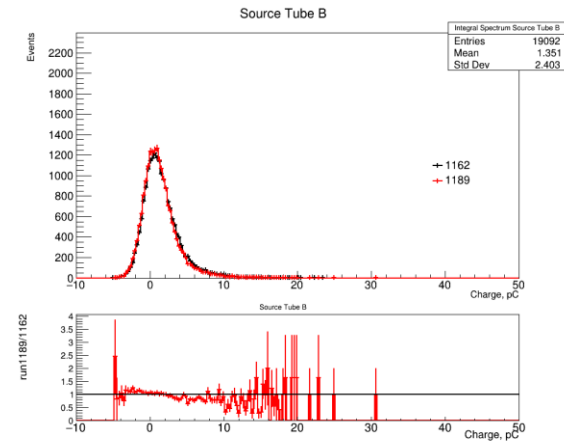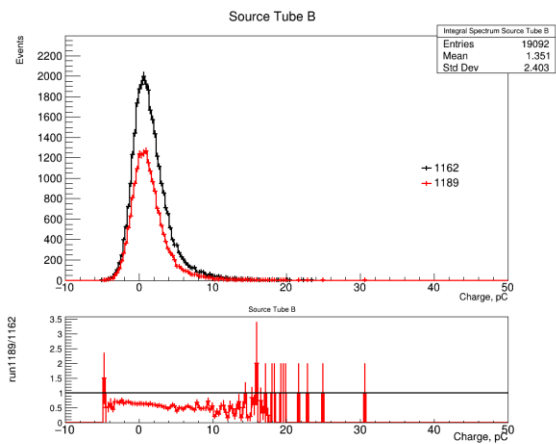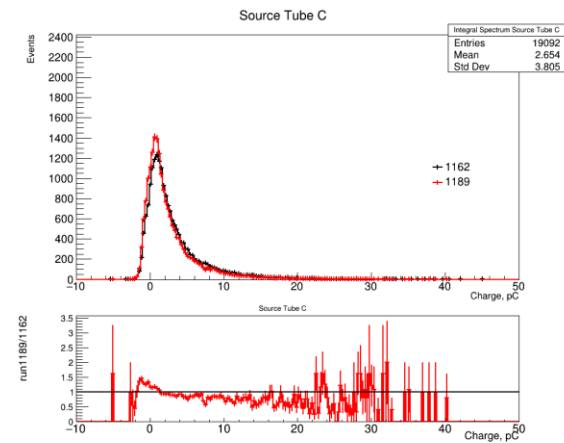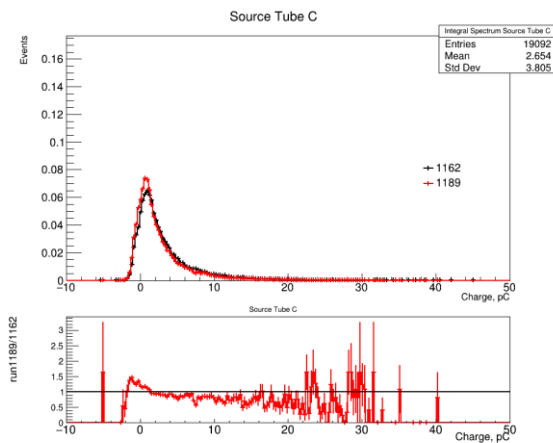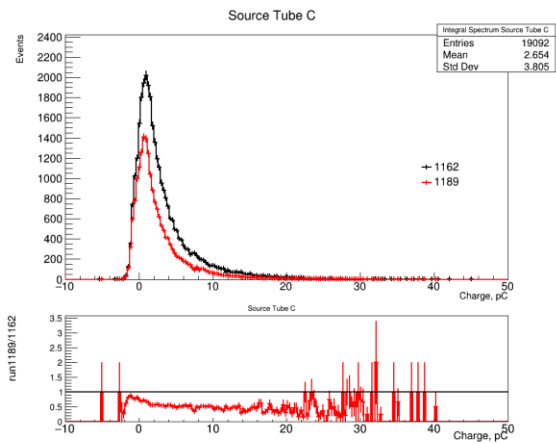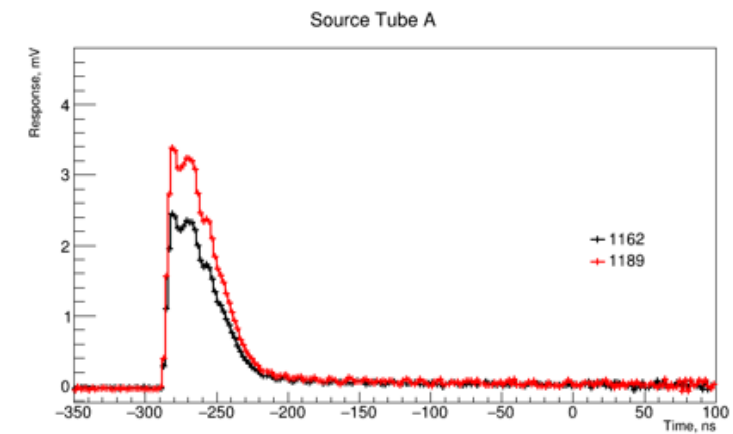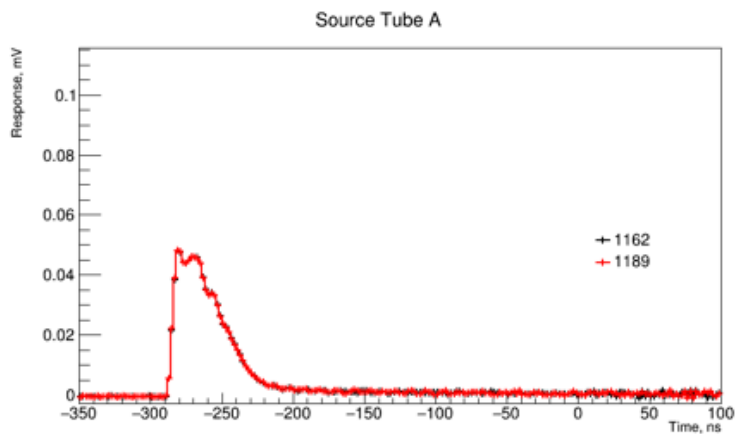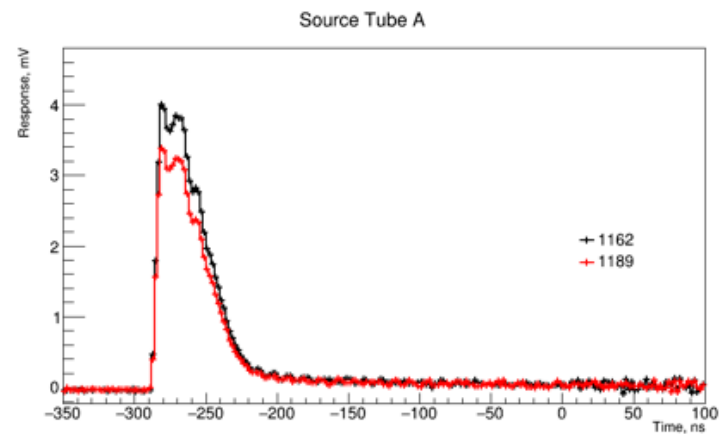
Tube B

Tube C
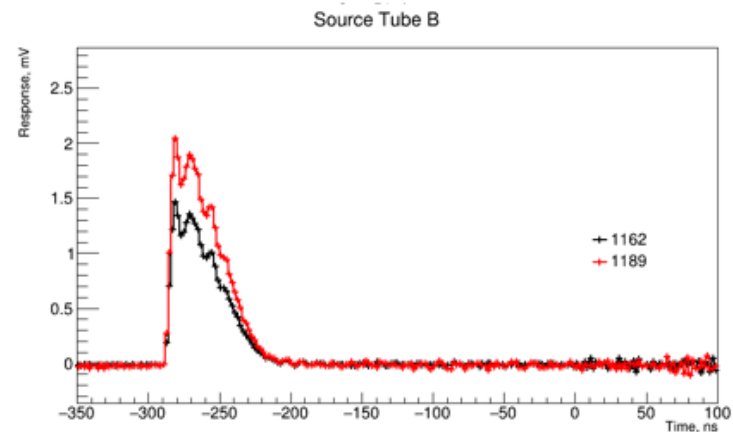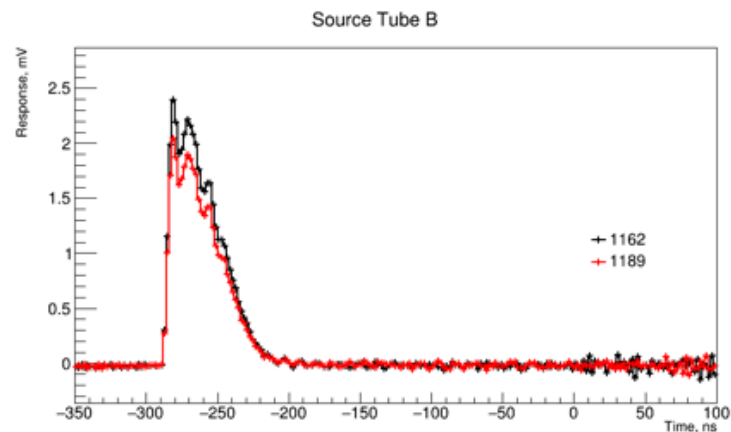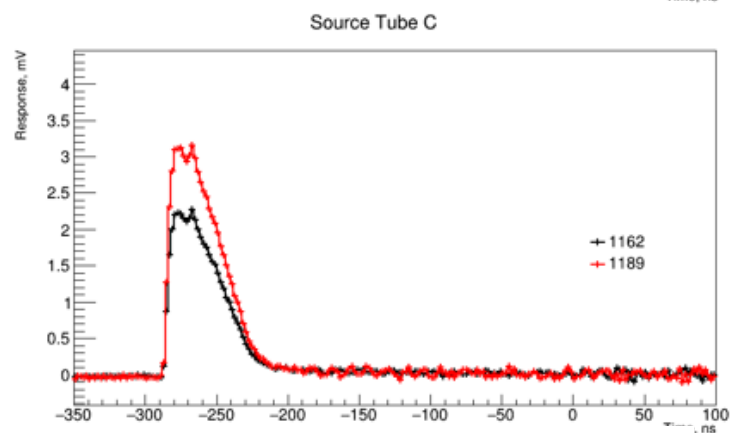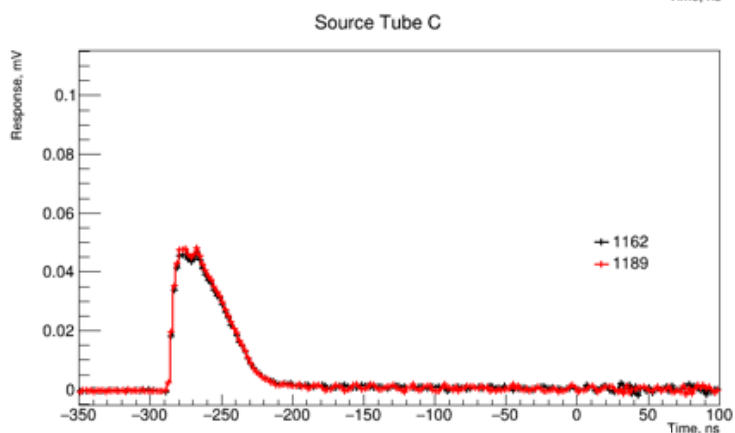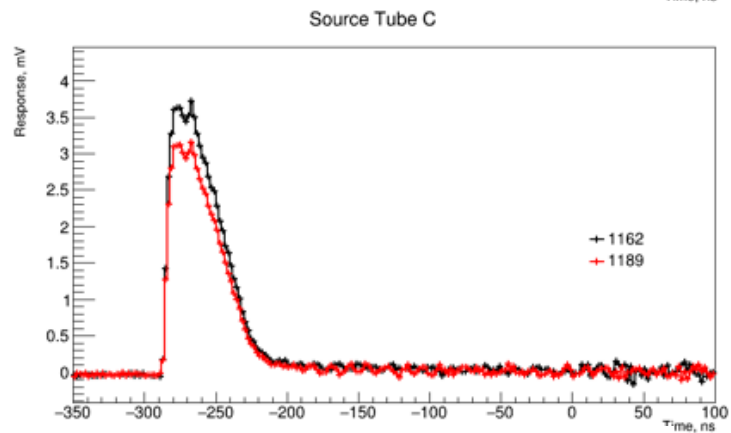
not normalised

normalised to 1

normalised to event #

FCal Tubes response

not normalised   normalised to 1   normalised to event #

Amplitude in FCal Tubes
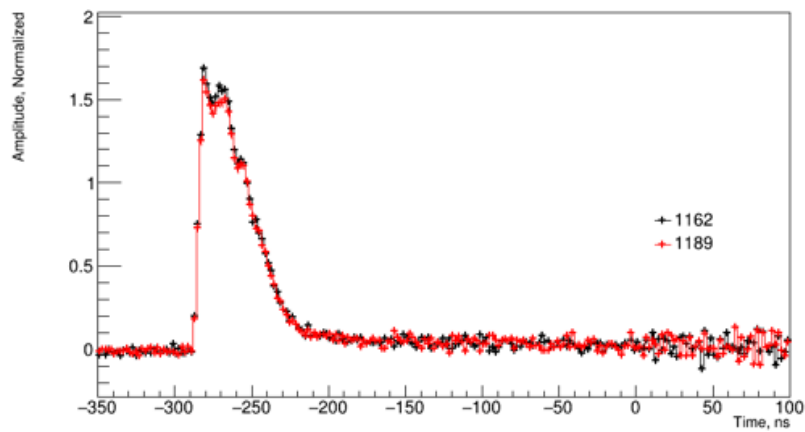
Tube 1
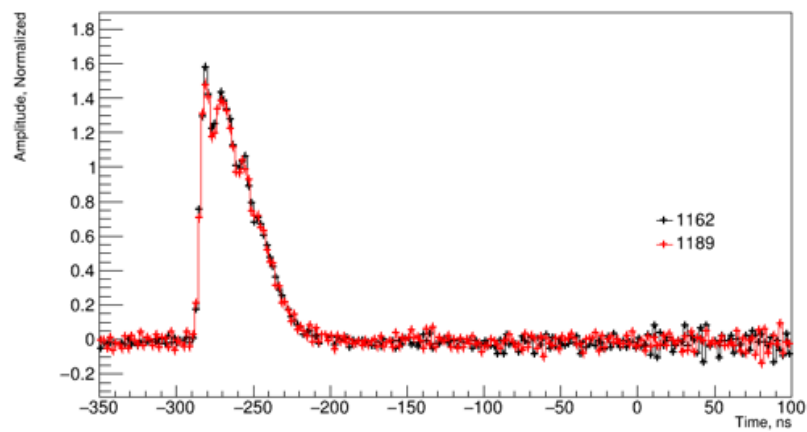
Tube 2
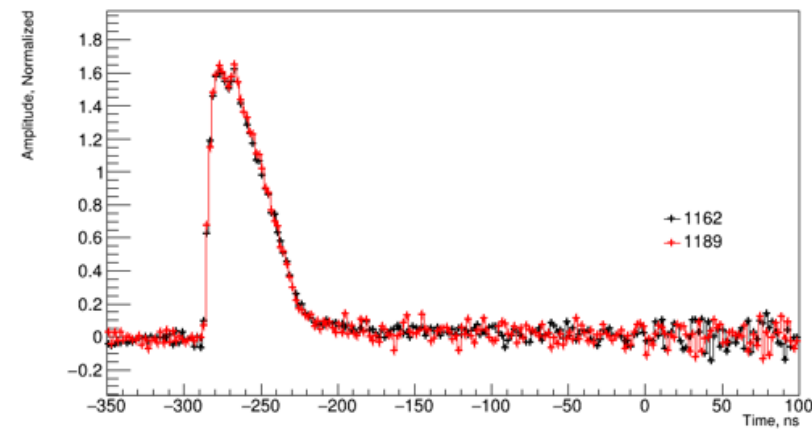
Tube 3

Comparison of run1163 w/ run1192

HV (FC mid, FC out, SC): +250, +250, -800
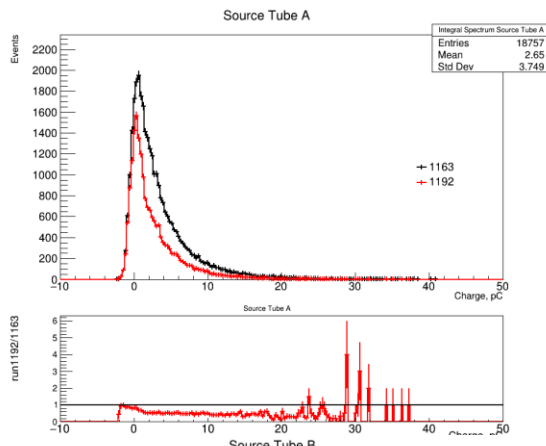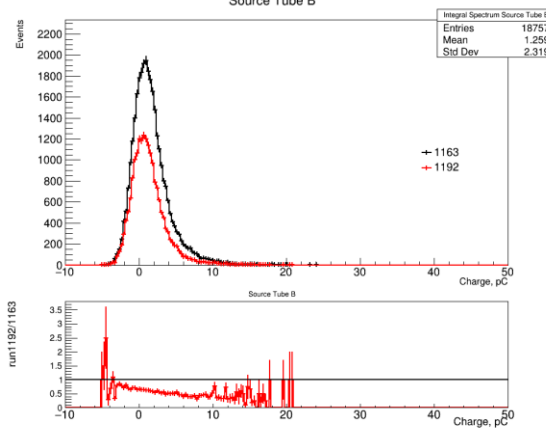
Spectrum in SCal front Quadrants

Spectrum in SCal rear Quadrants

Spectrum in FCal Tubes

not normalised
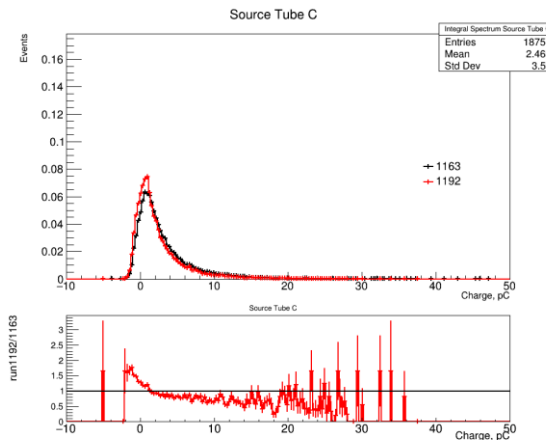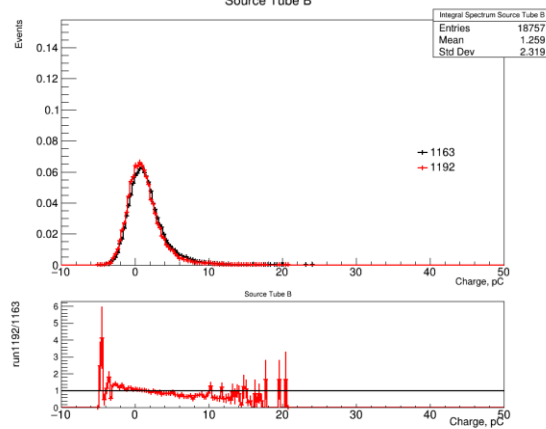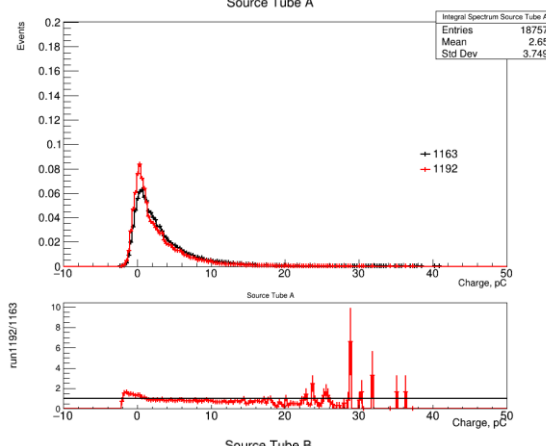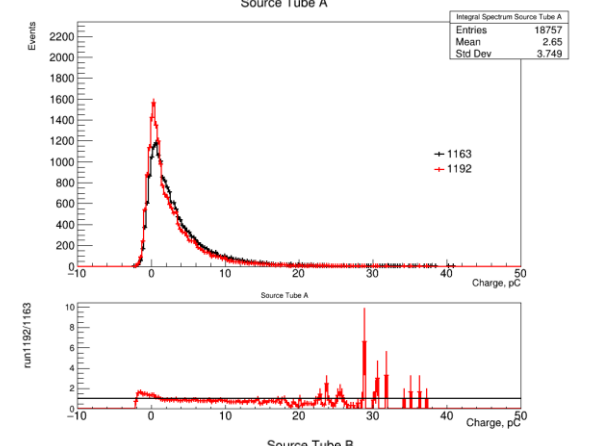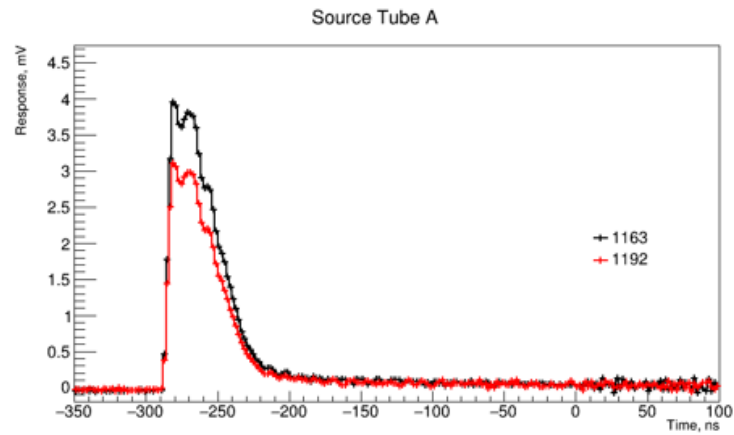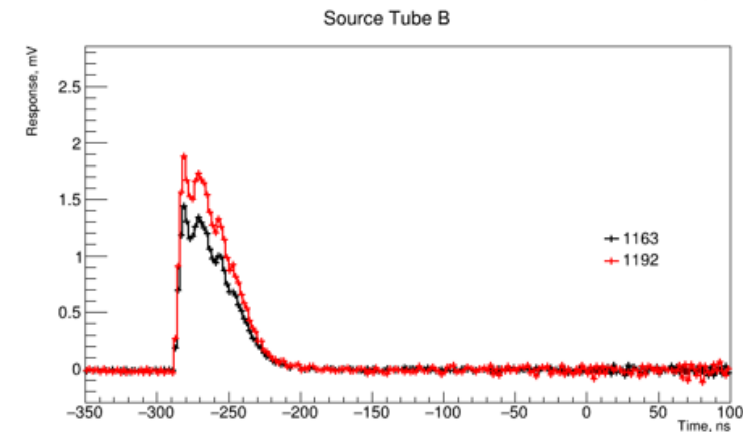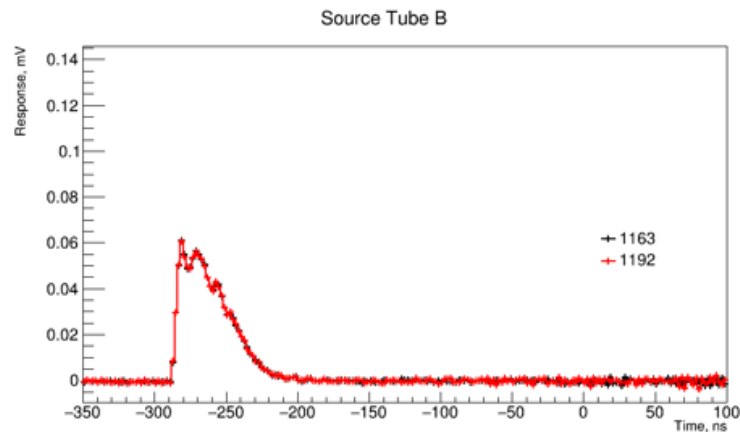
normalised to 1

normalised to event #

FCal Tubes response

Amplitude in FCal Tubes
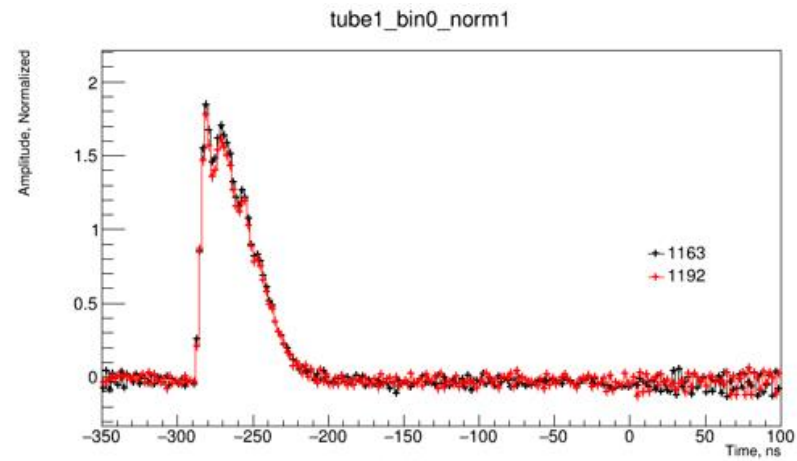
Tube 1   Tube 2   Tube 3

Comparison of run1170 w/ run1203
HV (FC mid, FC out, SC): -250, -250, -800

Spectrum in SCal front Quadrants
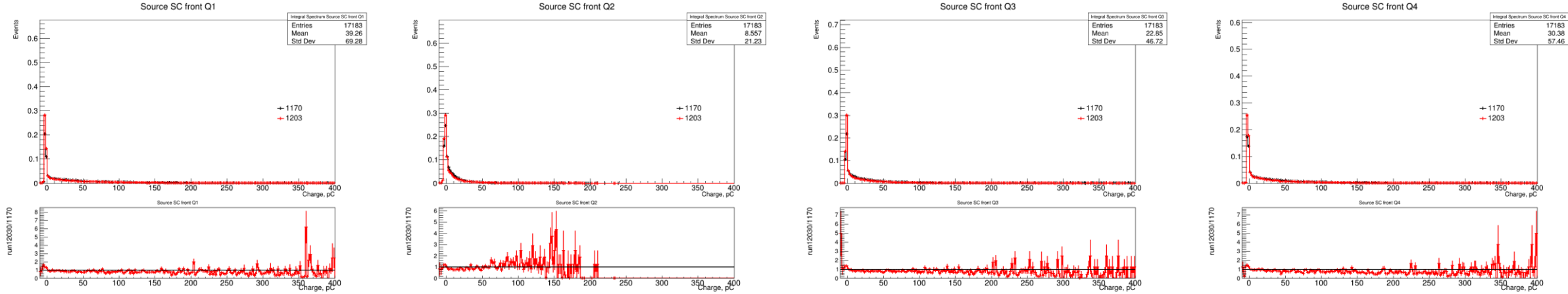
Spectrum in SCal rear Quadrants
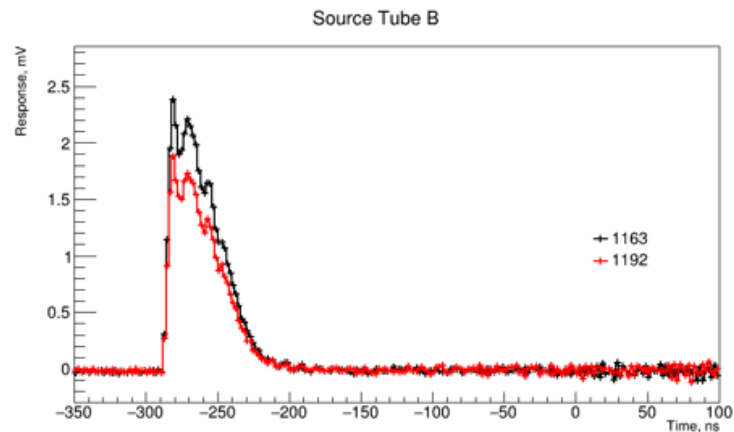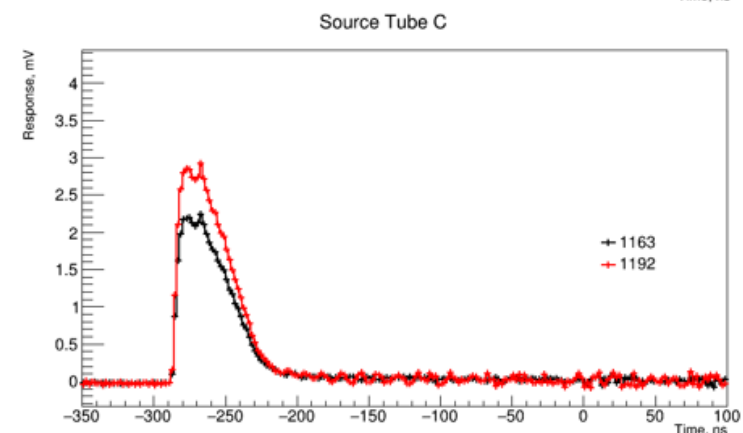
Spectrum in FCal Tubes
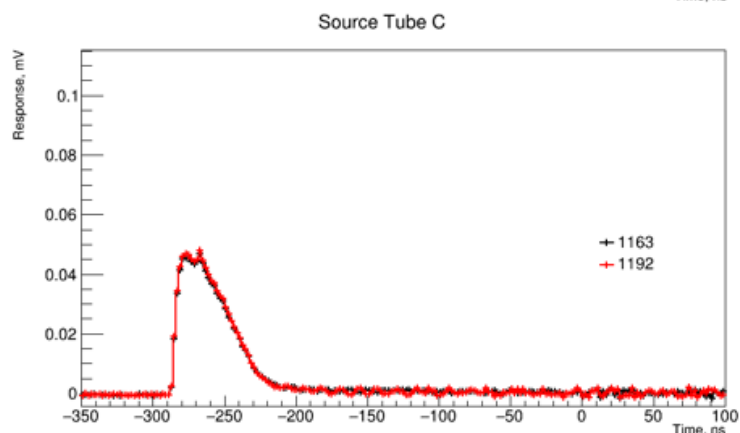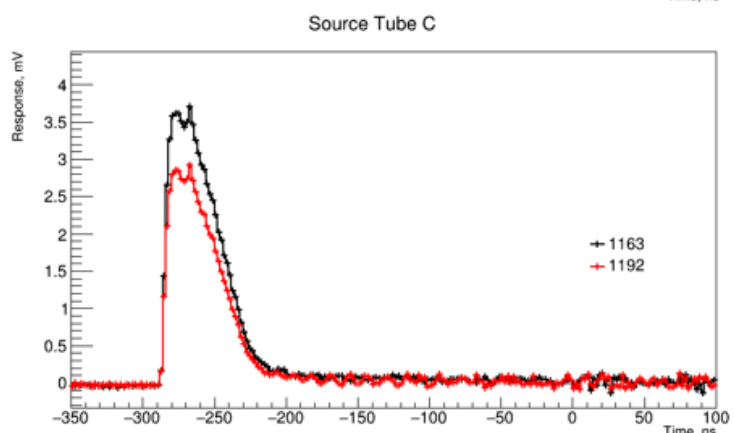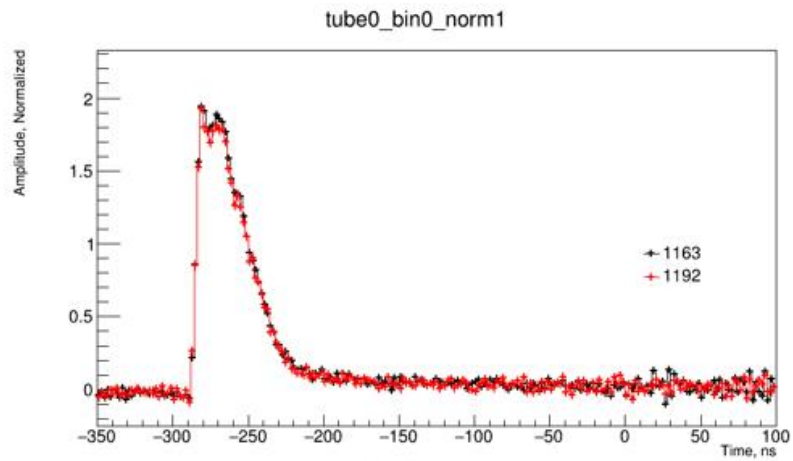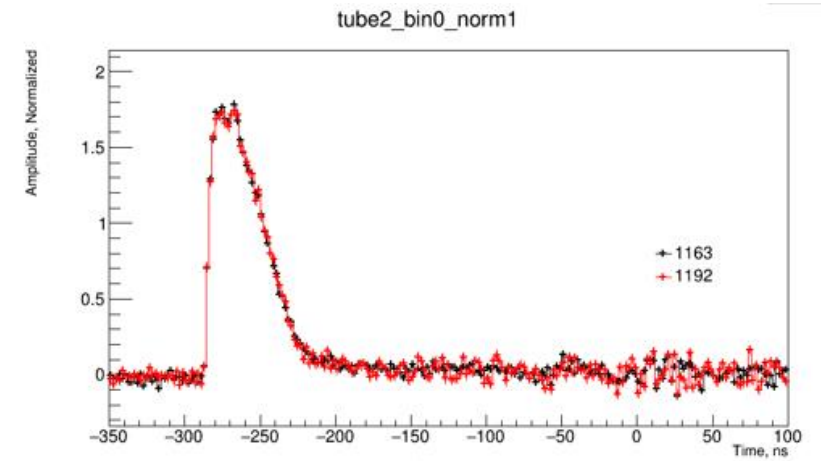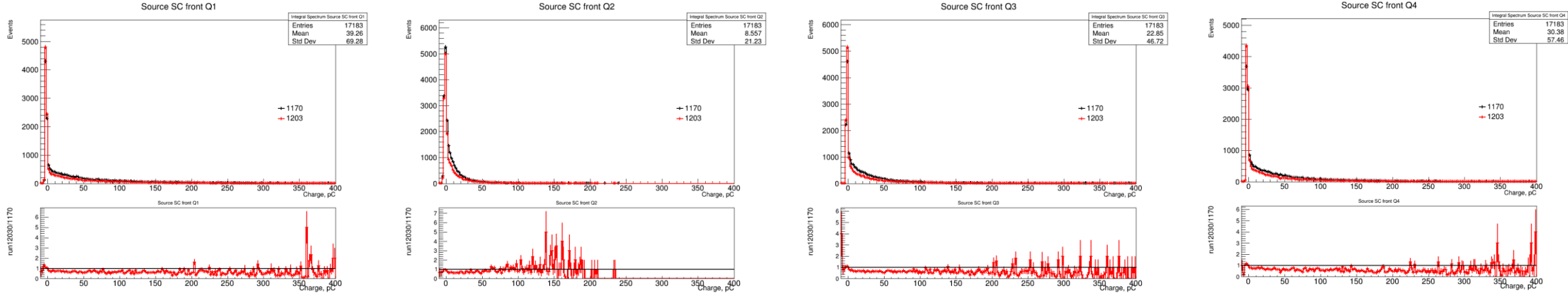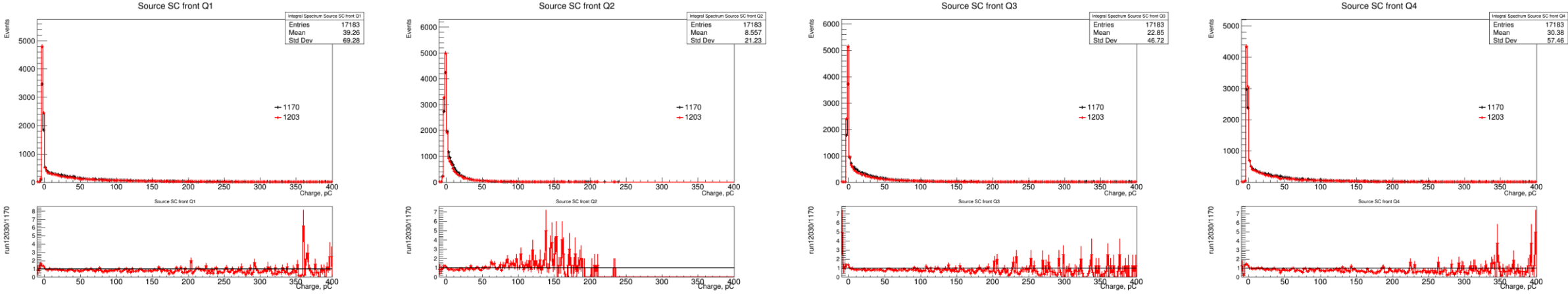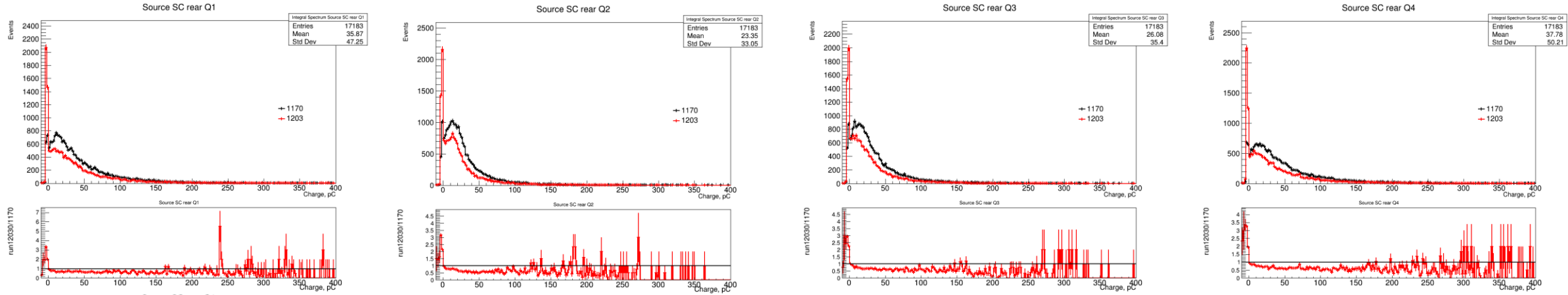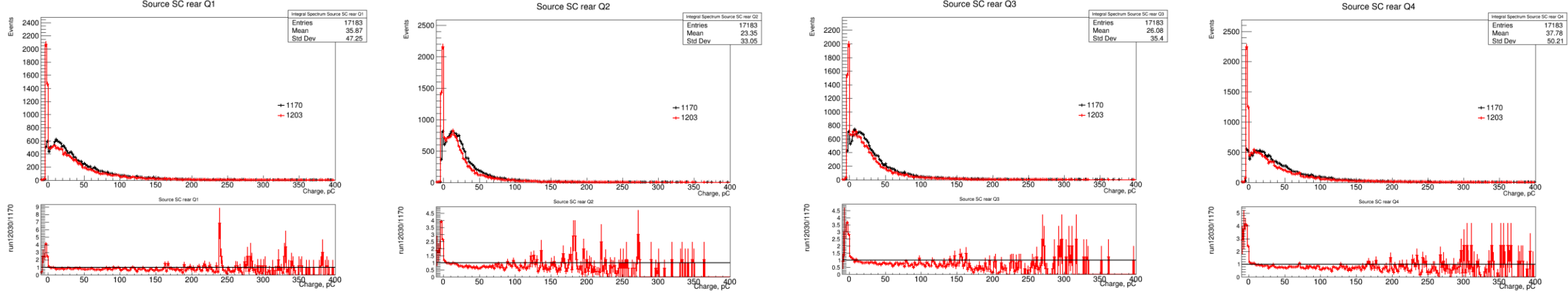

not normalised
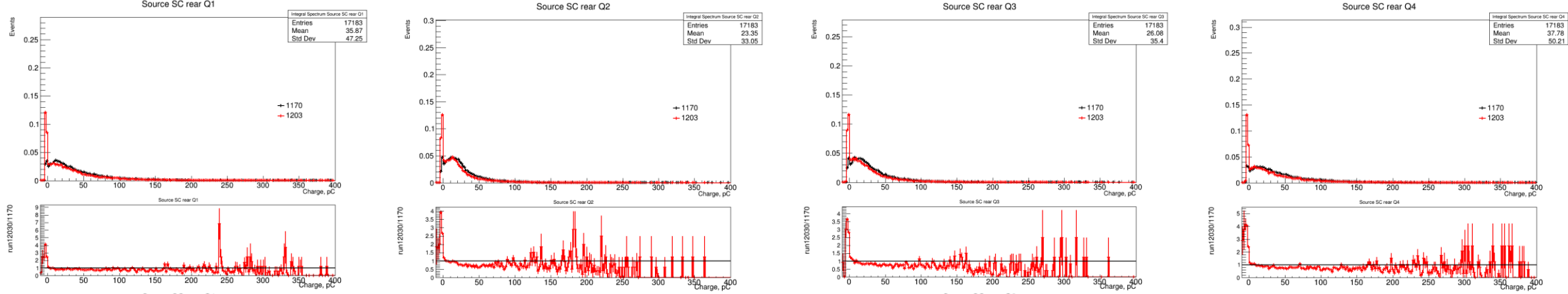
normalised to 1

normalised to event #

FCal Tubes response

Tube A — Tube B — Tube C (rows)
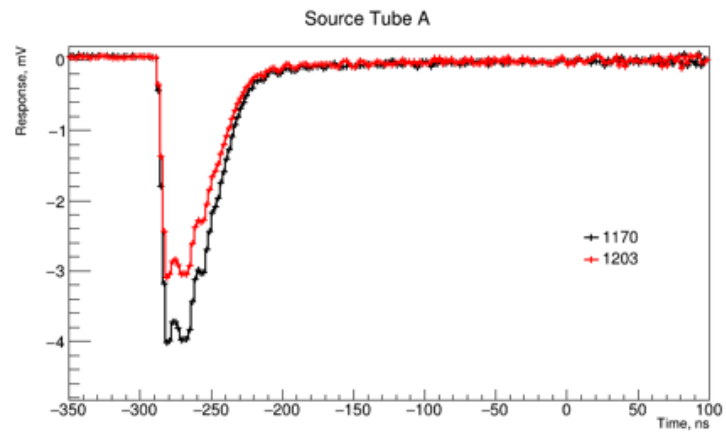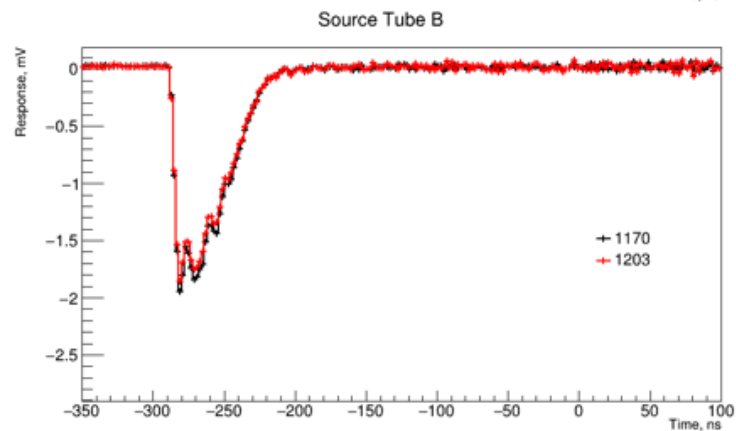
not normalised — normalised to 1 — normalised to event # (columns)

Amplitude in FCal Tubes

Tube 1

Tube 2

Tube 3
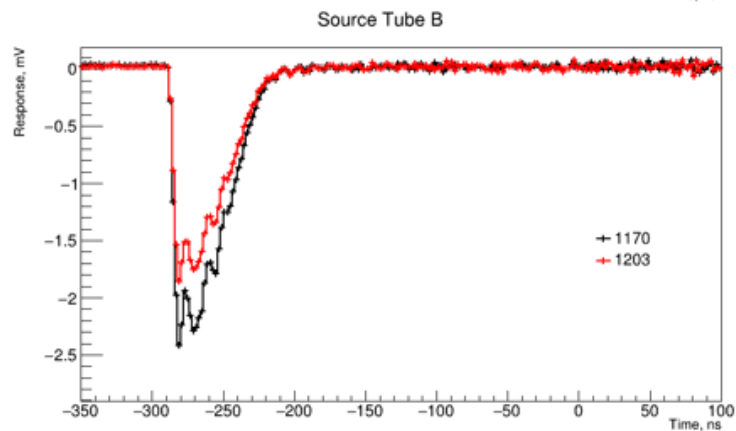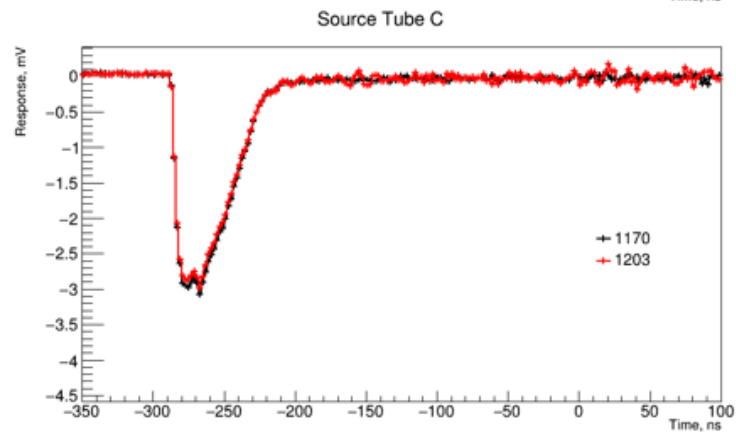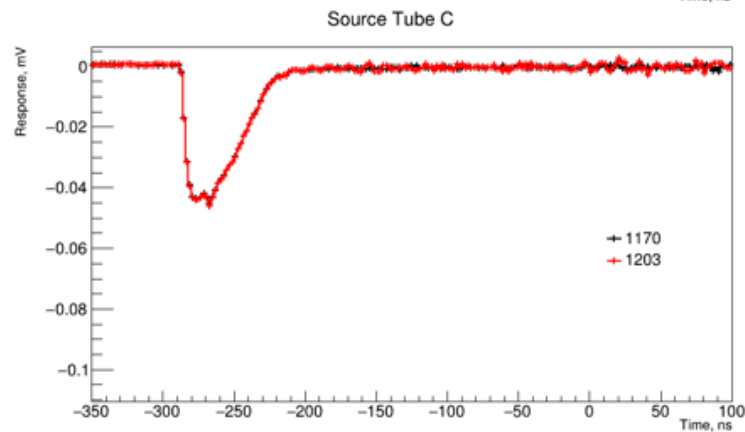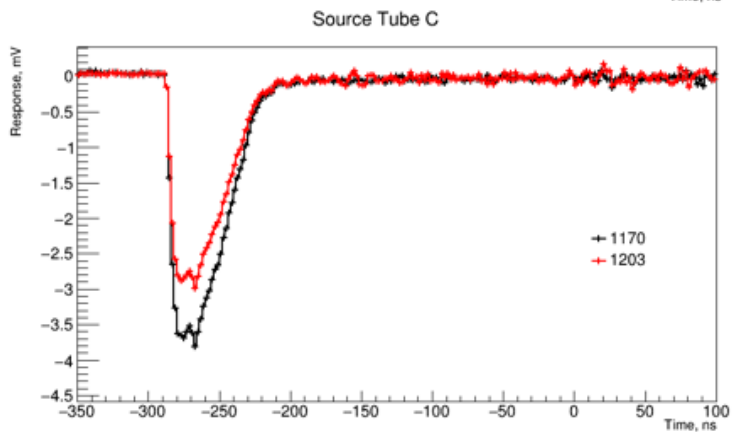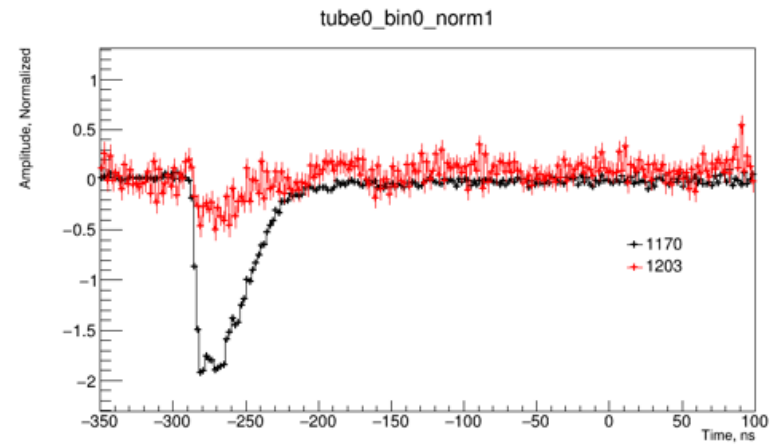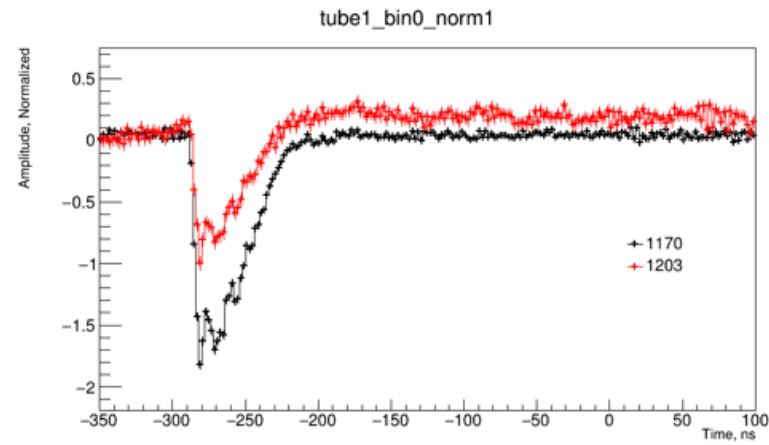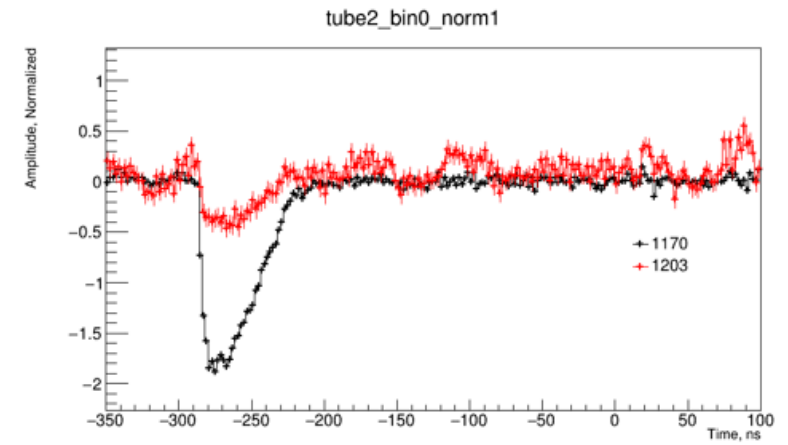
Conclusion

The number of events in the files and in the paper logbook does not match in some runs.

The difference between the signals in runs with and without oxygen contamination is more noticeable in the later run than in previous runs.

It looks like in the initial runs with oxygen contamination, the oxygen didn't mix completely.