

# Analysis of calorimeter data in TB19



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## Goal:

- Check synchronisation of the telescope and the calorimeter

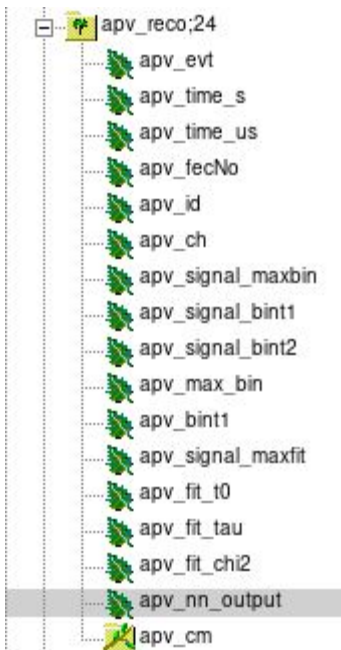
## Requirements:

- Telescope data  (Sasha will send in a few days)
- Calorimeter data 

## Current TODOs:

- Get acquainted with calorimeter data and check for bugs, etc.

# Signal selection and tree format



700.7 MB

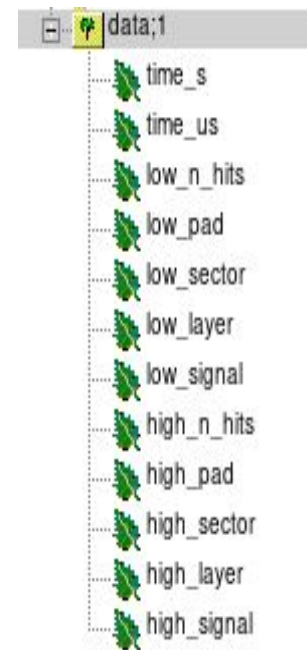


$$S(t) = A \frac{t-t_0}{\tau} e^{-\frac{t-t_0}{\tau}} \Theta(t - t_0)$$

Signal selection:

1.  $1 < \tau_{\text{fit}} < 3$
2.  $S_{\text{max}} > 0 \text{ ADC}$
3.  $t_{1,\text{bin}} - 2.7 < t_{0,\text{fit}} < t_{1,\text{bin}} - 0.5$
4.  $NN_{\text{output}} > 0.5$

Signals **before/after** selection: **15 000 000** / **3 900 000**



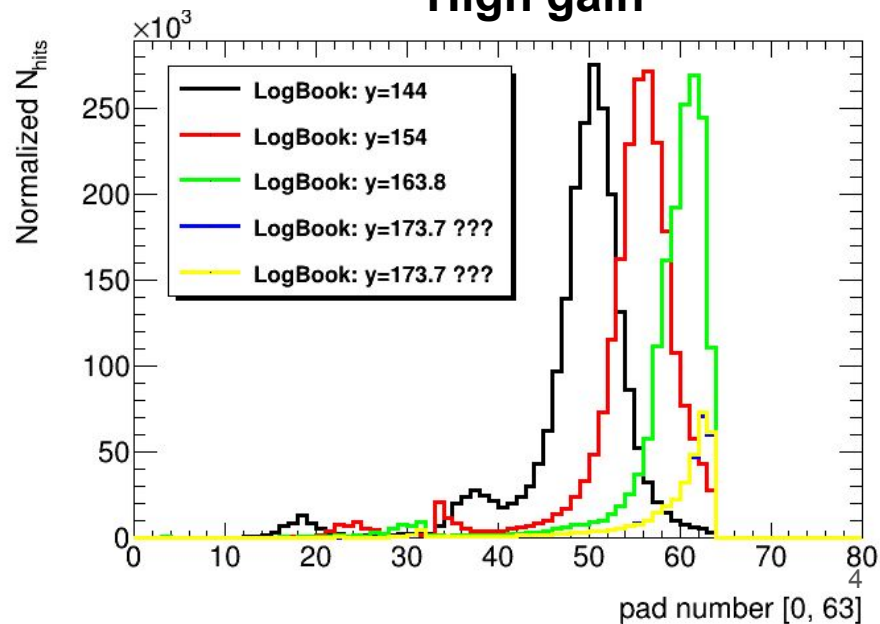
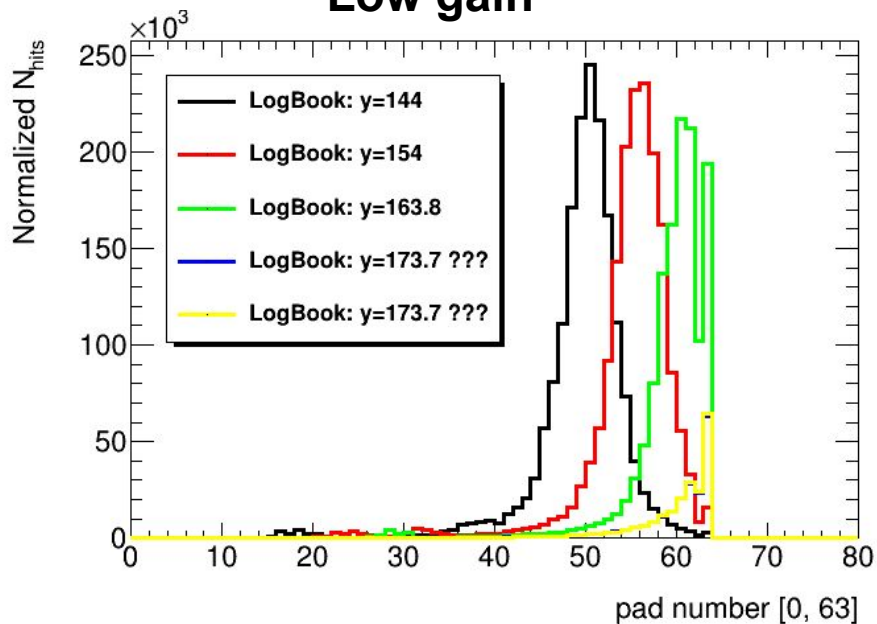
21.7 MB

# Position Scan

88	11/17/2019 11:29:43	Telescope, LumiCal	56	15	11/17/2019 10:29:00	FEC0, 5GeV, LumiCal position x= 80.1, y= 134.0
89	11/17/2019 12:07:57	Telescope, LumiCal	57	16	11/17/2019 11:06:00	FEC0, 5GeV, LumiCal position x=78.4, y= 144
90	11/17/2019 12:43:56	Telescope, LumiCal	56	18	11/17/2019 11:43:00	FEC1, 5GeV, LumiCal position x= 78.4, y= 144
91	11/17/2019 13:22:39	Telescope, LumiCal	57	19	11/17/2019 12:22:00	FEC1, 5GeV, LumiCal position x= 77.3, y= 154.0
92	11/17/2019 13:59:00	Telescope, LumiCal	58	20	11/17/2019 12:55:00	FEC0, 5GeV, LumiCal position, x= 77.3, y= 154
93	11/17/2019 14:33:36	Telescope, LumiCal	59	21	11/17/2019 13:32:00	FEC0, 5GeV, LumiCal position x= 75.9, y= 163.8
94	11/17/2019 15:25:59	Telescope, LumiCal	60	25	11/17/2019 14:20:00	FEC1, 5GeV, LumiCal position x= 75.9, y= 163.8
95	11/17/2019 16:03:40	Telescope, LumiCal	61	26	11/17/2019 15:03:00	FEC1 5GeV LumiCal position x= 173.7, y= 74.9
96	11/17/2019 16:40:02	Telescope, LumiCal	60	27	11/17/2019 15:38:00	FEC0 5GeV LumiCal position x= 173.7, y= 74.9
97	11/17/2019 17:13:37	Telescope, LumiCal	61	28	11/17/2019 16:13:00	recreat physics for FEC0 5GeV LumiCal position x=173.7, y=74.0
98	11/17/2019 18:18:25		62		11/17/2019 16:30:00	pedestal run FEC0
99	11/17/2019 18:19:21		62		11/17/2019 16:34:00	pedestal run FEC1
100	11/17/2019 18:25:16	Telescope, LumiCal	64	31	11/17/2019 17:12:00	physics run 5 GeV FEC0
101	11/17/2019 18:53:22	Telescope, LumiCal	63	32	11/17/2019 17:45:00	physics run 5 GeV FEC1

## Low gain

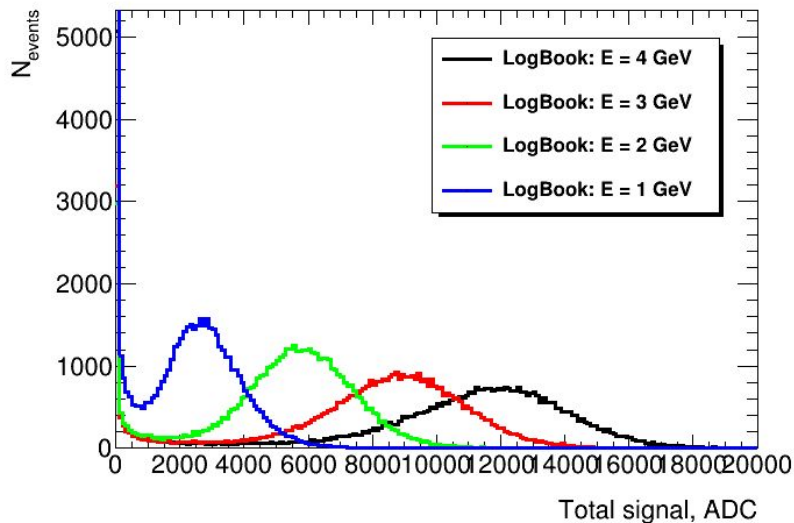
## High gain



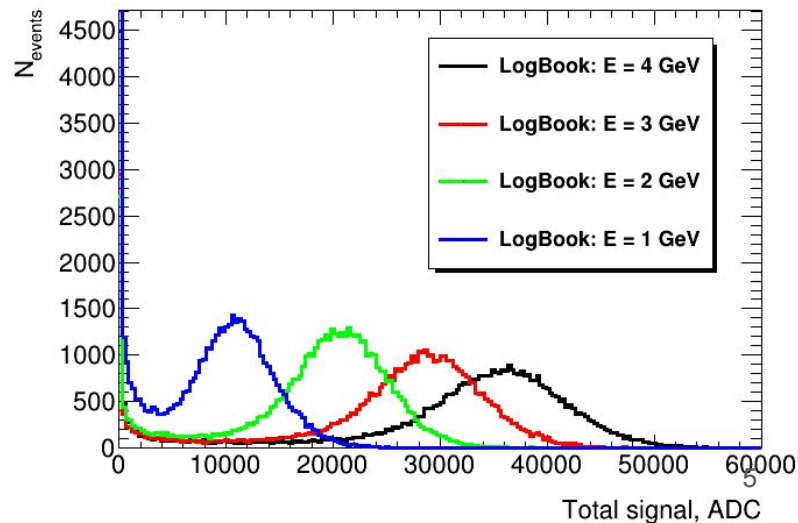
# Energy Scan

19	11/16/2019 1:30:49	Telescope, LumiCal	16	2887	11/16/2019 0:15:00	FEC0 4 GeV
20	11/16/2019 1:40:47	LumiCal	17		11/16/2019 0:33:00	pedecal FEC0
21	11/16/2019 2:14:20	Telescope, LumiCal	18	2888	11/16/2019 1:02:00	Physics
22	11/16/2019 2:31:28	LumiCal	3		11/16/2019 1:12:00	pedestal FEC1
23	11/16/2019 2:39:15	LumiCal	3		11/16/2019 1:35:00	Pedestal FEC1
24	11/16/2019 3:18:29	Telescope, LumiCal	4	2889	11/16/2019 2:16:00	physics 5 GeV FEC1
25	11/16/2019 3:52:09	Telescope, LumiCal	5	2890	11/16/2019 2:51:00	physics 5 GeV FEC1
26	11/16/2019 4:32:11	Telescope, LumiCal	20	2892	11/16/2019 3:19:00	physics FEC0 3 GeV
27	11/16/2019 4:46:54	Telescope, LumiCal	21	2893	11/16/2019 3:46:00	Physics 3 GeV FEC0
28	11/16/2019 5:10:34	Telescope, LumiCal	22	2894	11/16/2019 4:07:00	physics 3 GeV FEC0
29	11/16/2019 5:17:12	LumiCal	23		11/16/2019 4:17:00	pedestal FEC0
30	11/16/2019 5:30:25	LumiCal	24 & 25		11/16/2019 4:23:00	BAD . DataCollector 0
31	11/16/2019 5:46:32	Telescope, LumiCal	26	2897	11/16/2019 4:46:00	Physics 2 GeV FEC0
32	11/16/2019 6:06:58	Telescope, LumiCal	27	2898	11/16/2019 5:04:00	physics 2 GeV FEC0
33	11/16/2019 6:09:16	Telescope, LumiCal	28		11/16/2019 5:07:00	terminate DataCollector =0
34	11/16/2019 6:23:19	Telescope, LumiCal	29	2900	11/16/2019 5:21:00	physisc 1 GeV FEC0

## Low gain

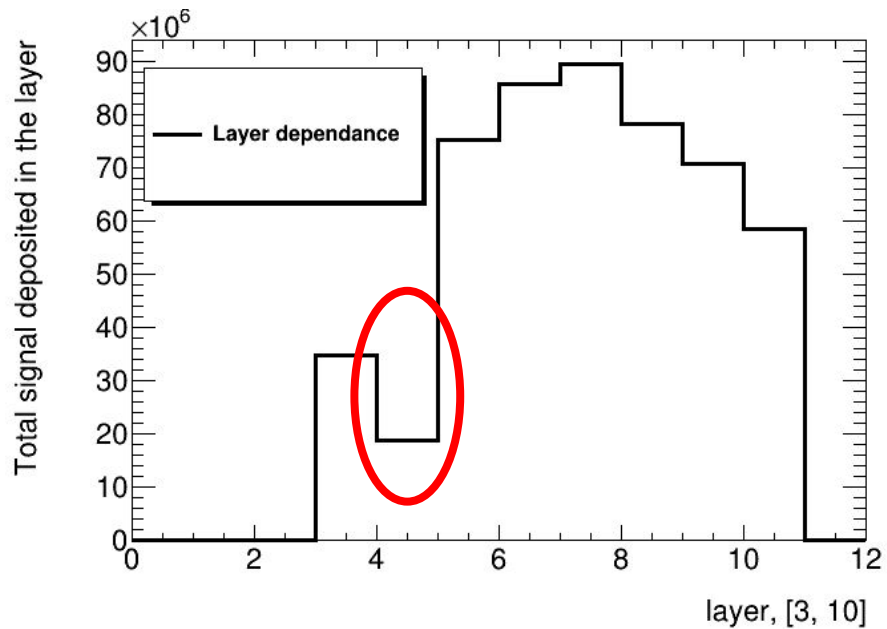


## High gain

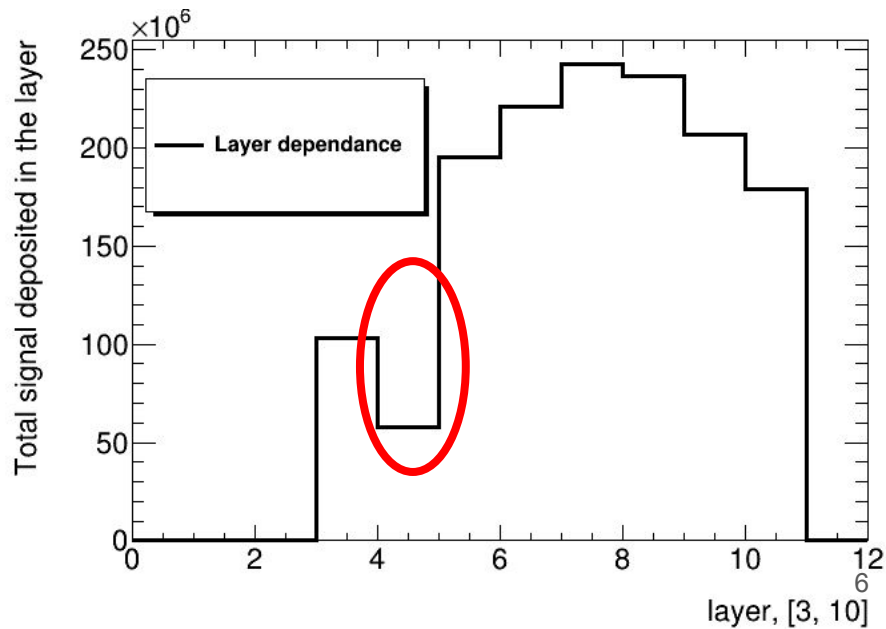


# Signal in layers

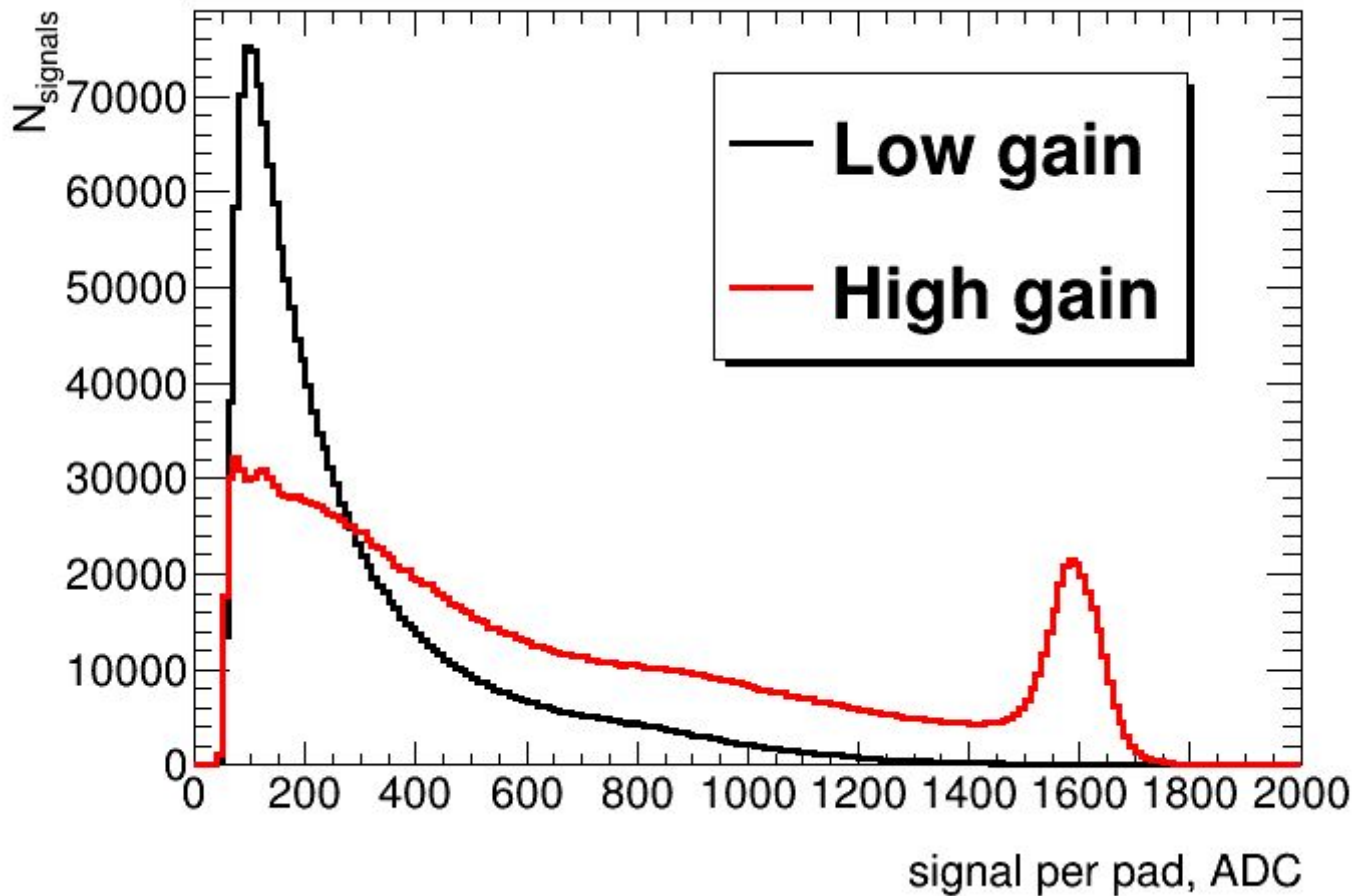
## Low gain



## High gain



# Pads occupancy



# Summary

- Minor questions: run19, logbook positions
- Layer4 deposition looks smaller than expected
- Can't understand wide-edge behaviour of high-gain peak
- **Position and energy scans give expected results.**

## TODOs: synchronization of telescope and LumiCal

- Will timestamps coincide in telescope and LumiCal?
- (If yes) Compare  $e^-$  position in both for the events with the same timestamps?
- Do they coincide to the  $\mu\text{s}$  or just seconds?