SEARCH FOR BELOW THRESHOLD EVENTS

E. Nebot for the BLM team

Reminder and motivation

- So far we have recorded 7 fast loss events that produced a dump (table below).
- Trying to extract extra information by increasing statistics considering less intense fast losses.

Event	Max signal Monitor	Max signal TCP Monitor	TCP/Magnet
07/07 18:22:20	BLMEI.08L7.B2I30_MBB 0.0388 Gy/s	BLMEI.06R7.B2I10_TCP.B6R7.B2 0.0353 Gy/s	0.910
30/07 05:26:39	BLMQI.04L5.B2E30_MQY 0.0224 Gy/s	BLMEI.06R7.B2I10_TCP.B6R7.B2 0.0197 Gy/s	0.879
07/08 00:14:39	BLMQI.11L4.B1I10_MQ 0.0363 Gy/s	BLMEI.06L7.B1E10_TCP.C6L7.B1 0.0201 Gy/s	0.554
07/08 23:10:47	BLMQI.15L5.B1I10_MQ 0.0304 Gy/s	BLMEI.06L7.B1E10_TCP.B6L7.B1 0.0185 Gy/s	0.609
14/08 19:13:37	BLMQI.04L5.B2E20_MQY 0.0240 Gy/s	BLMEI.06R7.B2I10_TCP.B6R7.B2 0.0101 Gy/s	0.421
23/08 11:50:39	BLMQI.22R3.B2E10_MQ 0.0270 Gy/s	BLMEI.06R7.B2I10_TCP.B6R7.B2 0.0310 Gy/s	1.148
26/08 15:25:57	BLMQI.25R5.B1E10_MQ 0.0352 Gy/s	BLMEI.06L7.B1E10_TCP.B6L7.B1 0.0604 Gy/s	0.439

First analyzed fills

Fill	Duration (h)	Start
1253	~13.53	31/07 21:11:59
1256	~1.45	01/08 01:50:09
1258	~7.51	02/08 22:20:39
1260	~2.47	04/08 02:21:28
1262	~19.06	04/08 15:41:27
1263	~15.36	06/08 01:53:24
1264	~0.7	06/08 23:42:51
1266	~2.08	07/08 21:12:06
1267	~13.76	08/08 03:19:17
1268	~3	08/08 23:29:01
1271	~5.15	10/08 05:25:34

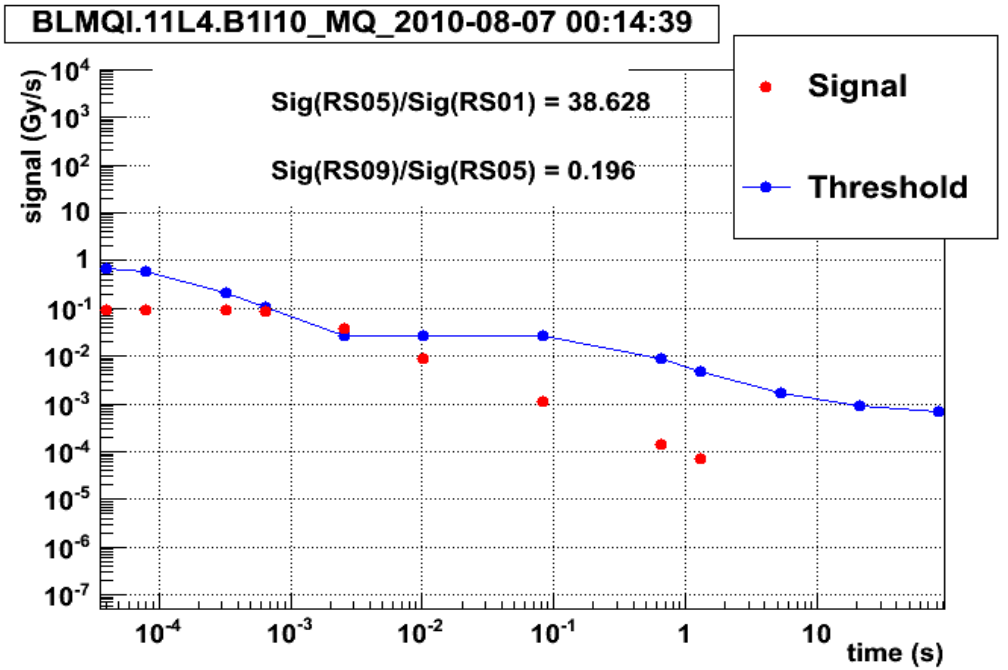
Scan 11 Fills (STABLE BEAM → BEAM DUMP)

Processed **~86 hours** of STABLE BEAM (24 bunches)

Methodology

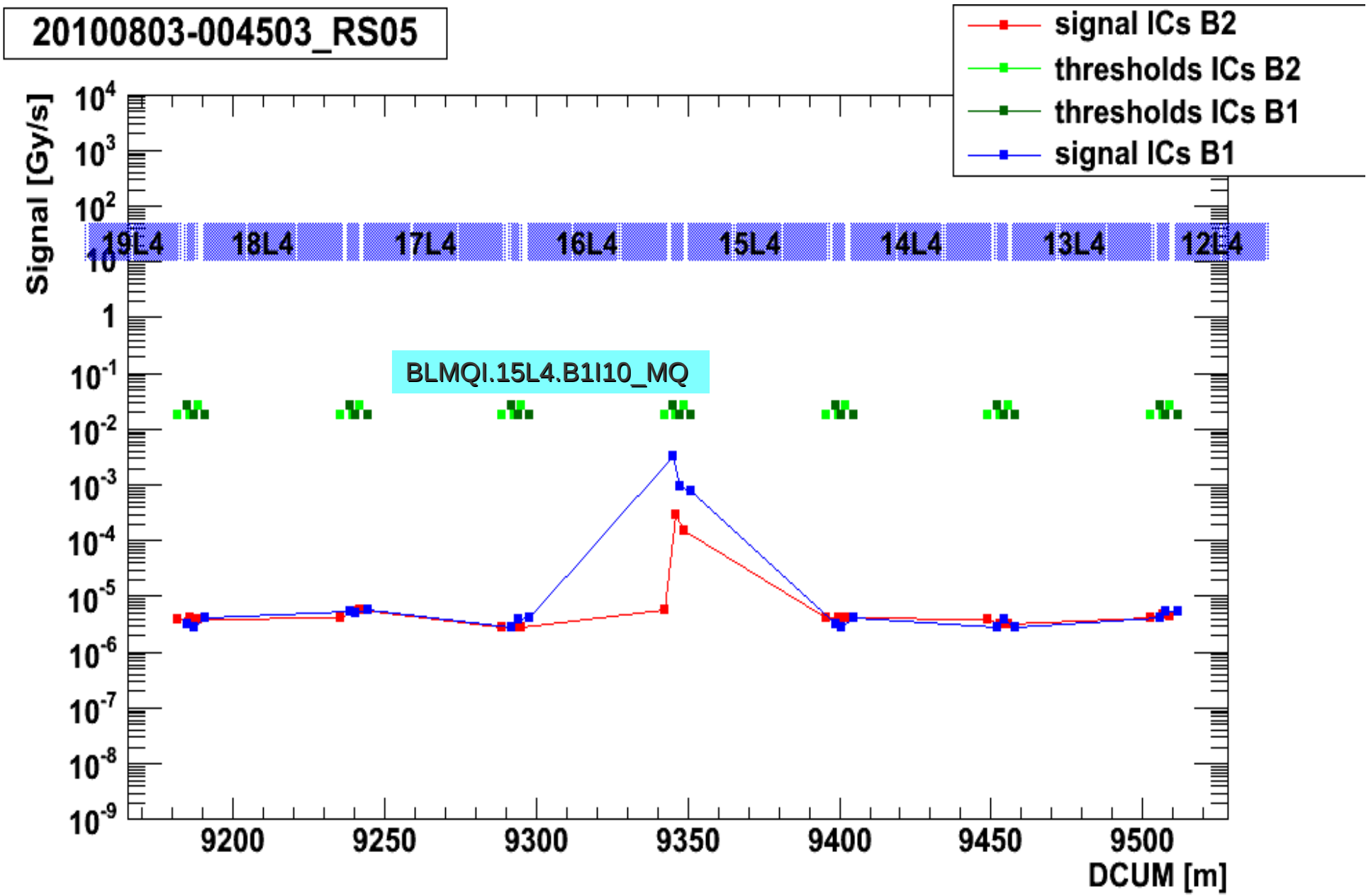
Scanning the logging database for fast losses below the threshold. Requirements (on RS05, 2.56 ms) due to the loss pattern:

- At least one monitor with signal over threshold higher than 1 %
- At least three monitors within 40 m following the fast loss pattern. (R51 >20 & R95 < 0.8)

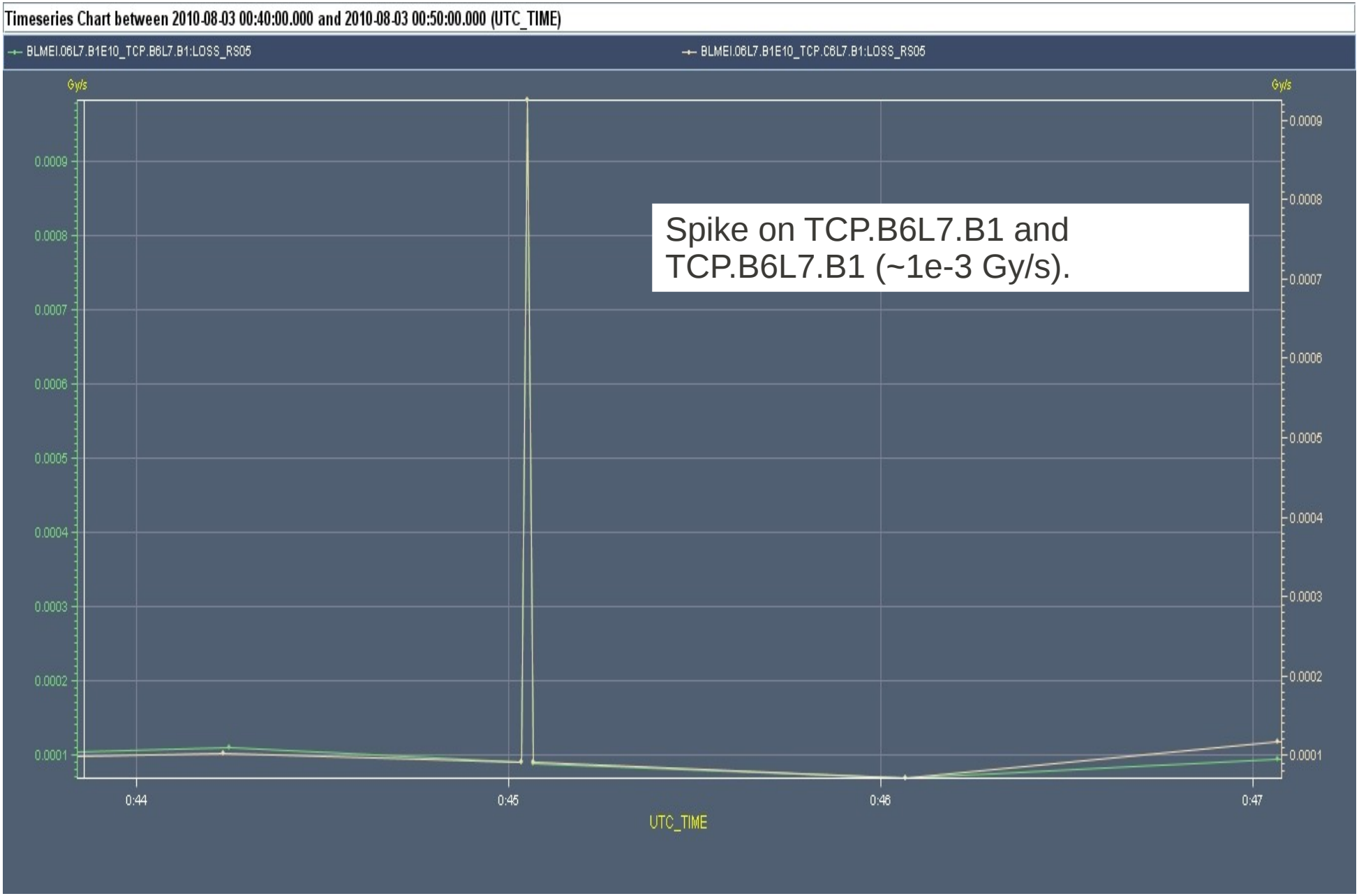


- Signal requested in the primary collimators requested to be at least 8.2 E-4 Gy/s (A factor 10 above the noise level for IC)

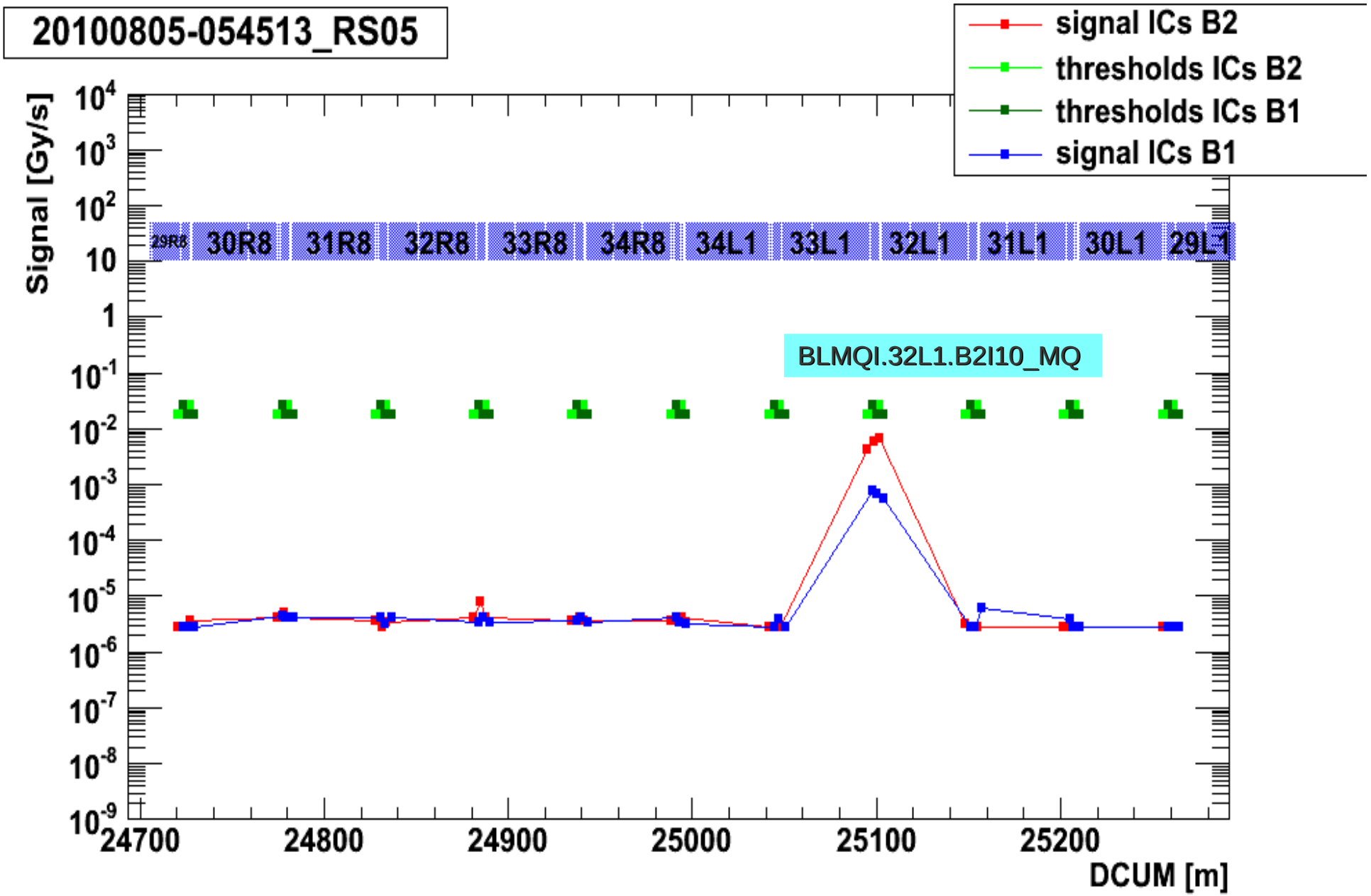
Candidate: fill 1258 (#4-like)



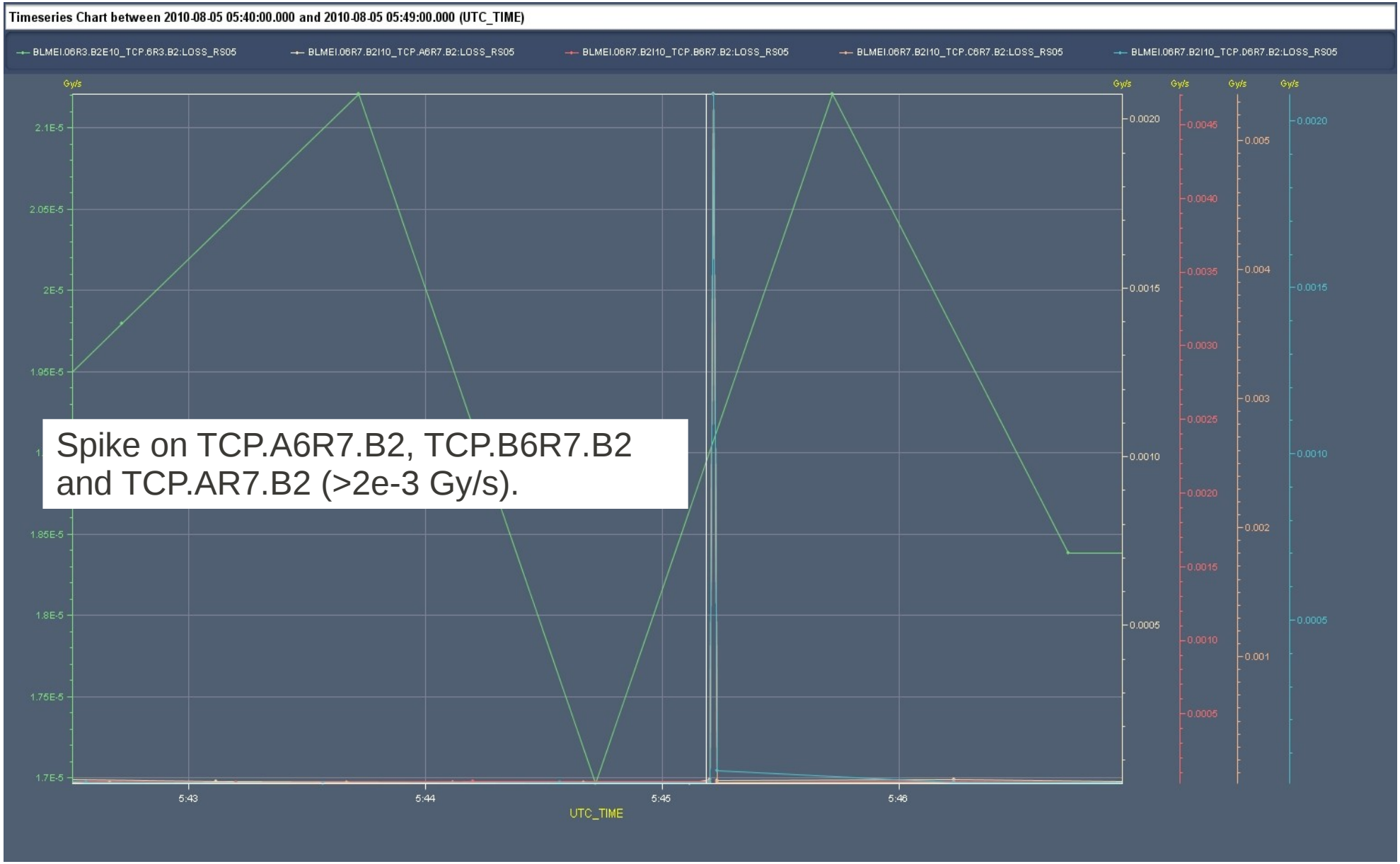
Candidate: fill 1258



Candidate: fill 1262 (#4-like)

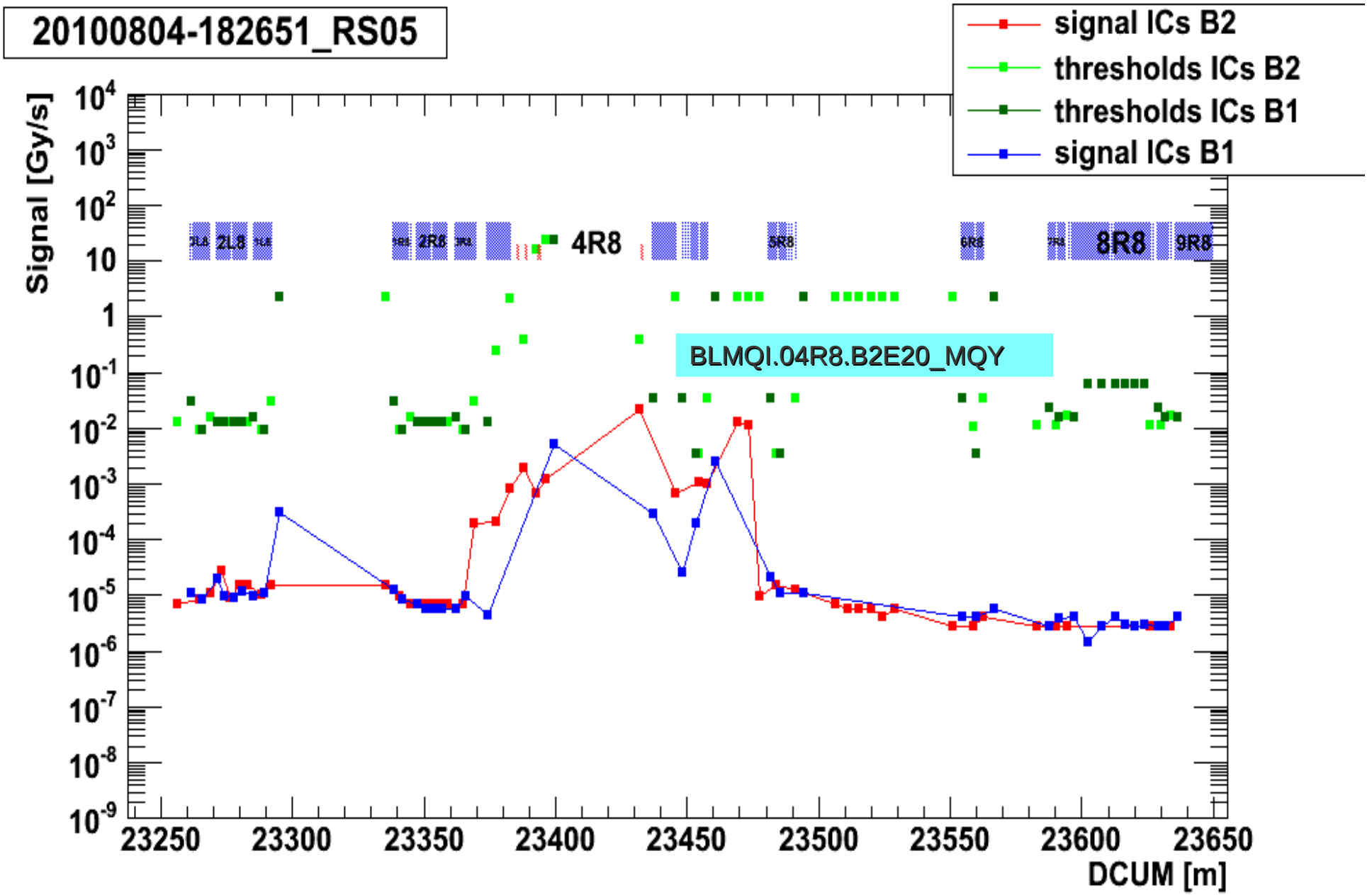


Candidate: fill 1262

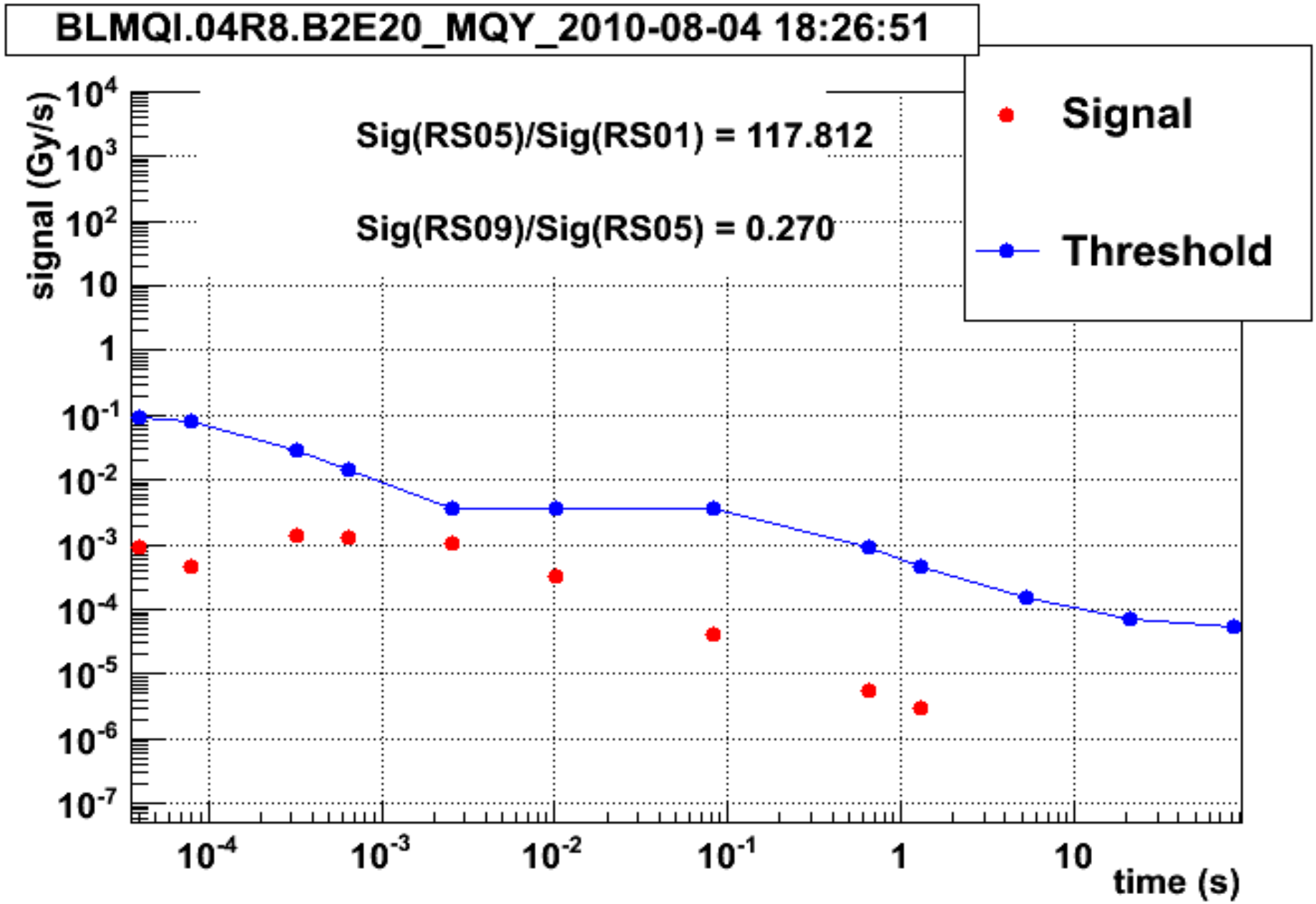


Spike on TCP.A6R7.B2, TCP.B6R7.B2 and TCP.AR7.B2 (>2e-3 Gy/s).

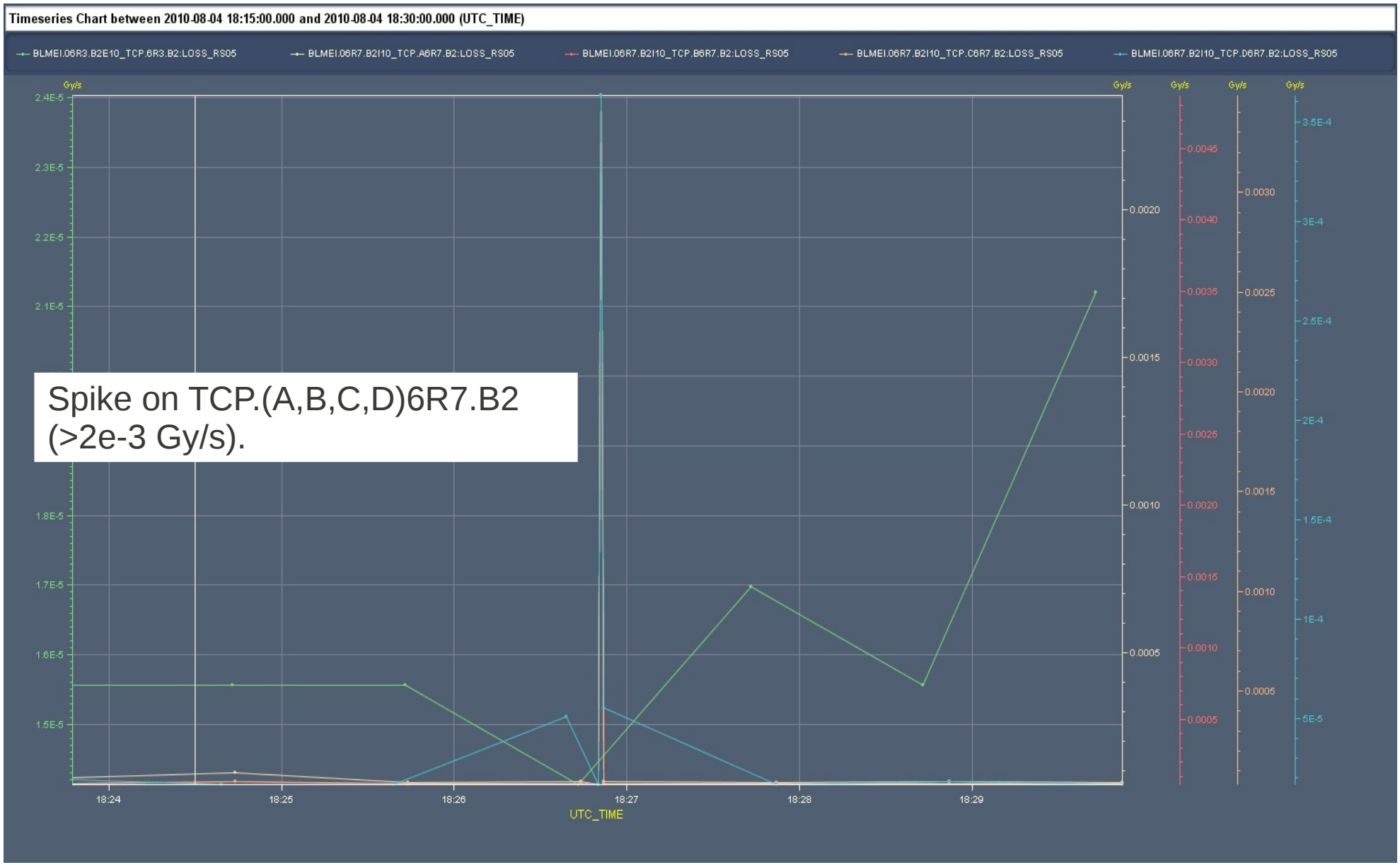
Candidate: fill 1262 (#2 event)



Candidate: fill 1262 (#2 event)

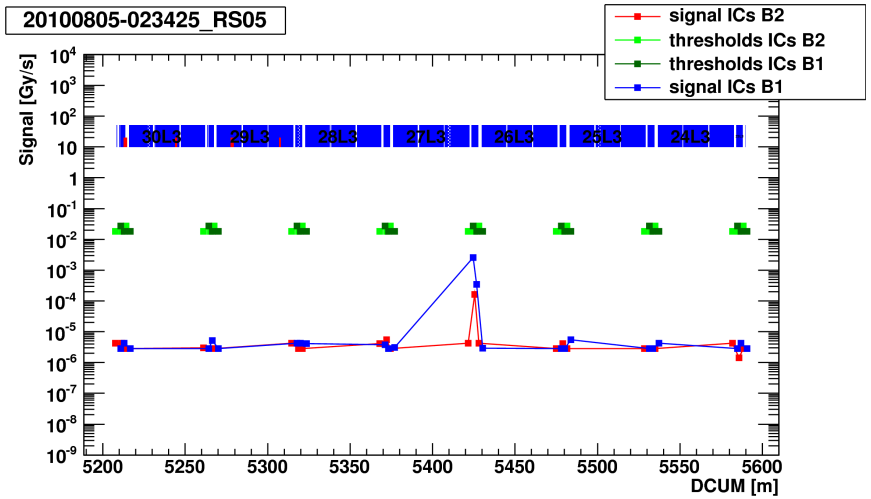


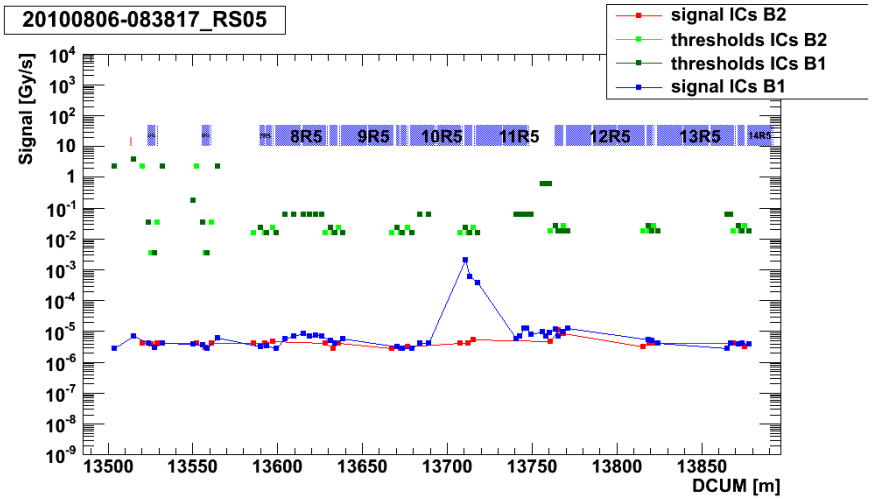
Candidate: fill 1262

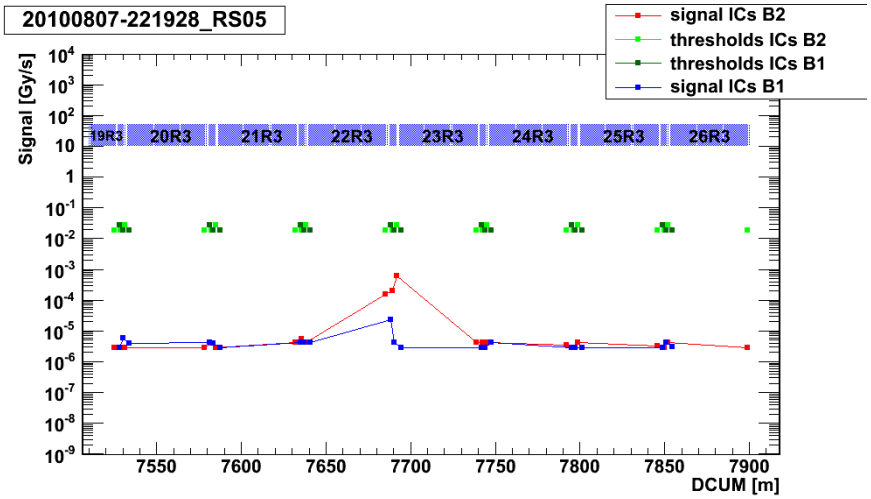


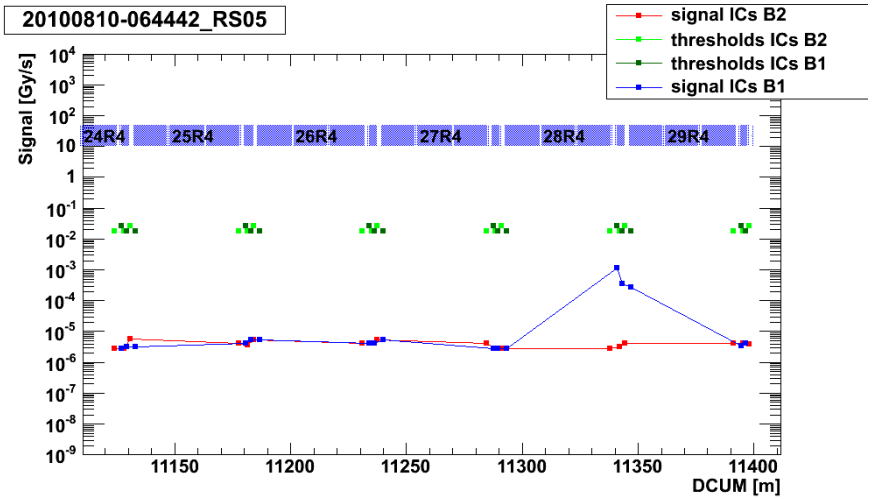
Spike on TCP.(A,B,C,D)6R7.B2 (>2e-3 Gy/s).

Events with no losses in TCPs









Summary table

Time	Monitor Name	Signal (Gy/s)	Sig/Thr	TCP	TCP/Magnet
03/08 00:04:58	BLMQI.09R1.BIE20_MQM	2.39 E-4	0.015	< 8.2 E-4	---
03/08 00:45:03	BLMQI.15L4.B1I10_MQ	3.19 E-3	0.119	1.0 E-3	0.313
04/08 18:26:51	BLMQI.04R8.B2E20_MQY	1.06 E-3	0.302	4.9 E-3	4.9
05/08 02:34:25	BLMQI.26L3L5.B1I10_MQ	2.54 E-3	0.09	< 8.2 E-4	---
05/08 04:09:39	BLMQI.25L5.B2E10_MQ	7.14 E-4	0.027	< 8.2 E-4	---
05/08 05:45:13	BLMQI.32L1.B2E10_MQ	6.73 E-3	0.251	5.3 E-3	0.78
06/08 08:38:17	BLMQI.10R5.B1E10_MQML	2.05 E-3	0.087	< 8.2 E-4	---
07/08 22:19:28	BLMQI.22R3.B2E10_MQ	6.04 E-4	0.022	< 8.2 E-4	---
10/08 06:44:42	BLMQI.28R4.B1I10_MQ	1.17 E-3	0.043	< 8.2 E-4	---

Conclusions and work plan

- About 80 hours of stable beam have been analyzed finding 9 events with significant local losses.
- Three of these events left a relatively high signal in TCP monitors (0.03 events/h).

- The current procedure to analyze these events is rather tedious. The plan is to automatize the procedure to scan new fills as they come.
- Fills from August 10th to be included in the analysis (ongoing work).

Back up

Events with no losses in TCPs