SEARCH FOR BELOW THRESHOLD EVENTS

E. Nebot for the BLM team

Reminder

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 17:13:37	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)

Extended analysis

Fill	Duration (h)	Start
1283	~13.0	13/08 21:07
1284	~3.5	14/08 13:45
1285	~13.5	14/08 22:39
1287	~13.2	15/08 21:01
1293	~12.1	18/08 07:12
1295	~15.0	19/08 21:36
1298	~13.2	22/08 22:49
1299	~3.4	23/08 22:11
1301	~14.3	24/08 15:35
1303	~13.2	26/08 02:21
1305	~3.5	27/08 04:11
1308	~11.7	28/08 20:42
1309	~13.0	29/08 16:17

~55.3 hours
(24 Bunches)

~87.3 hours
(48 Bunches)

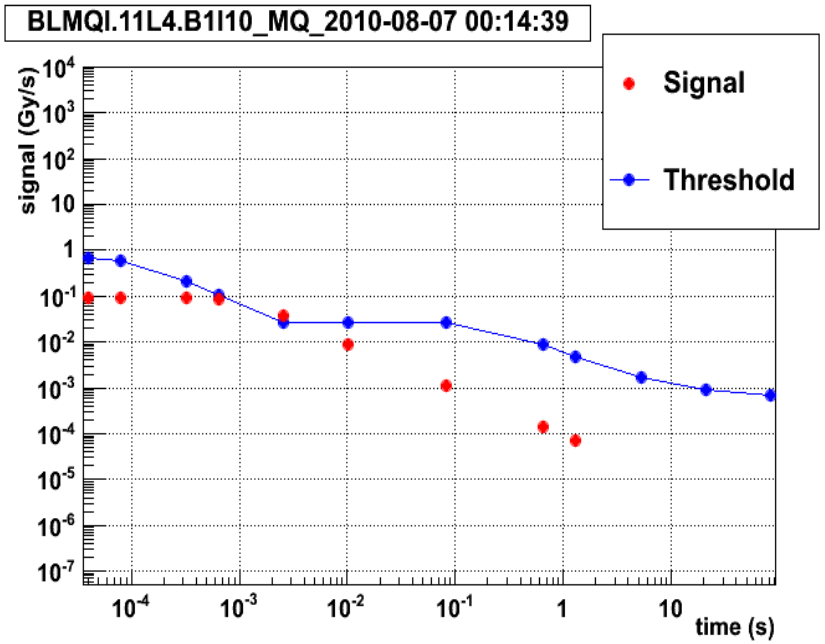
Methodology

1 - Signal > **S** in primary Collimators.

S = 6.0 e-4 Gy/s

2 - Clusters of at least 3 monitors (within 40 m) with Signal > **S**.

3 - All three monitors following fast loss pattern (S3/S5 > 0.20 and S9/S5 < 0.01)



Fast losses in 24 bunches fills

Event	Max signal Monitor	Max signal TCP Monitor	TCP/Magnet
07/08 00:14:39	BLMQI.11L4.B1I10_MQ 0.0363 Gy/s	BLMEI.06L7.B1E10_TCP.C6L7.B1 0.0201 Gy/s	0.55
07/08 23:10:47	BLMQI.15L5.B1I10_MQ 0.0304 Gy/s	BLMEI.06L7.B1E10_TCP.B6L7.B1 0.0185 Gy/s	0.61
14/08 17:13:37	BLMQI.04L5.B2E20_MQY 0.0240 Gy/s	BLMEI.06R7.B2I10_TCP.B6R7.B2 0.0101 Gy/s	0.42
03/08 00:45:03	BLMQI.15L4.B1I10_MQ 0.00319 Gy/s	BLMEI.06L7.B1E10_TCP.B6L7.B1 0.00098 Gy/s	0.32
04/08 18:26:51	BLMQI.04R8.B2E20_MQY 0.00106 Gy/s	BLMEI.06R7.B2I10_TCP.B6R7.B2 0.00490 Gy/s	4.62
05/08 05:45:13	BLMQI.32L1.B2E10_MQ 0.00673 Gy/s	BLMEI.06R7.B2I10_TCP.C6R7.B2 0.0053 Gy/s	0.78
14/08 08:06:07	BLMQI.15L5.B2E10_MQ 0.00364 Gy/s	BLMEI.06R7.B2I10_TCP.B6R7.B2 0.0186 Gy/s	5.11
16/08 08:46:13	BLMQI.16R3.B2E10_MQ 0.00195 Gy/s	BLMEI.06R7.B2I10_TCP.B6R7.B2 0.000978 Gy/s	0.50

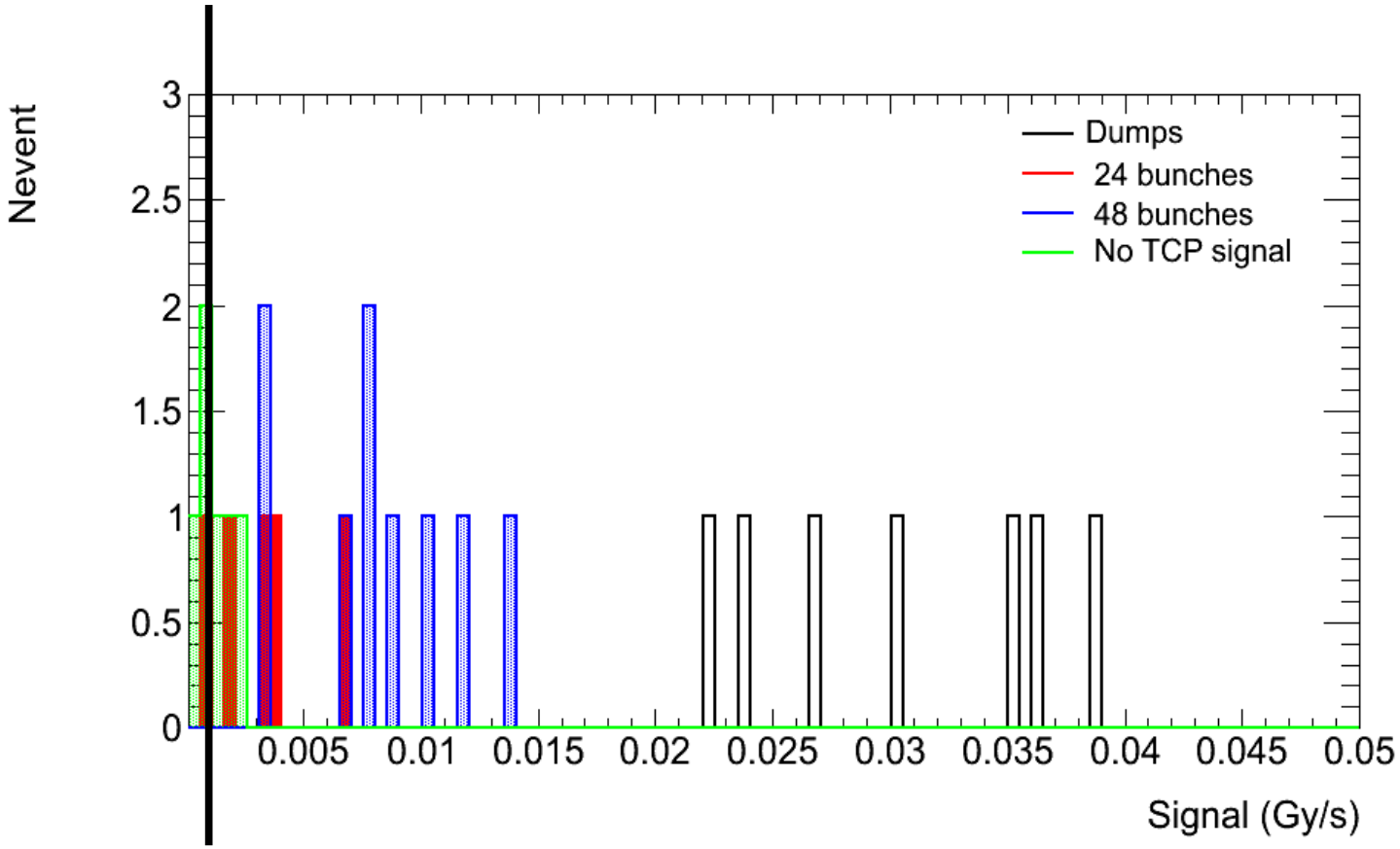
RATIO = (3 + 3 + 2)evts/(55.3+86)hours = **0.0566 evts/h**

Fast losses in 24 bunches fills

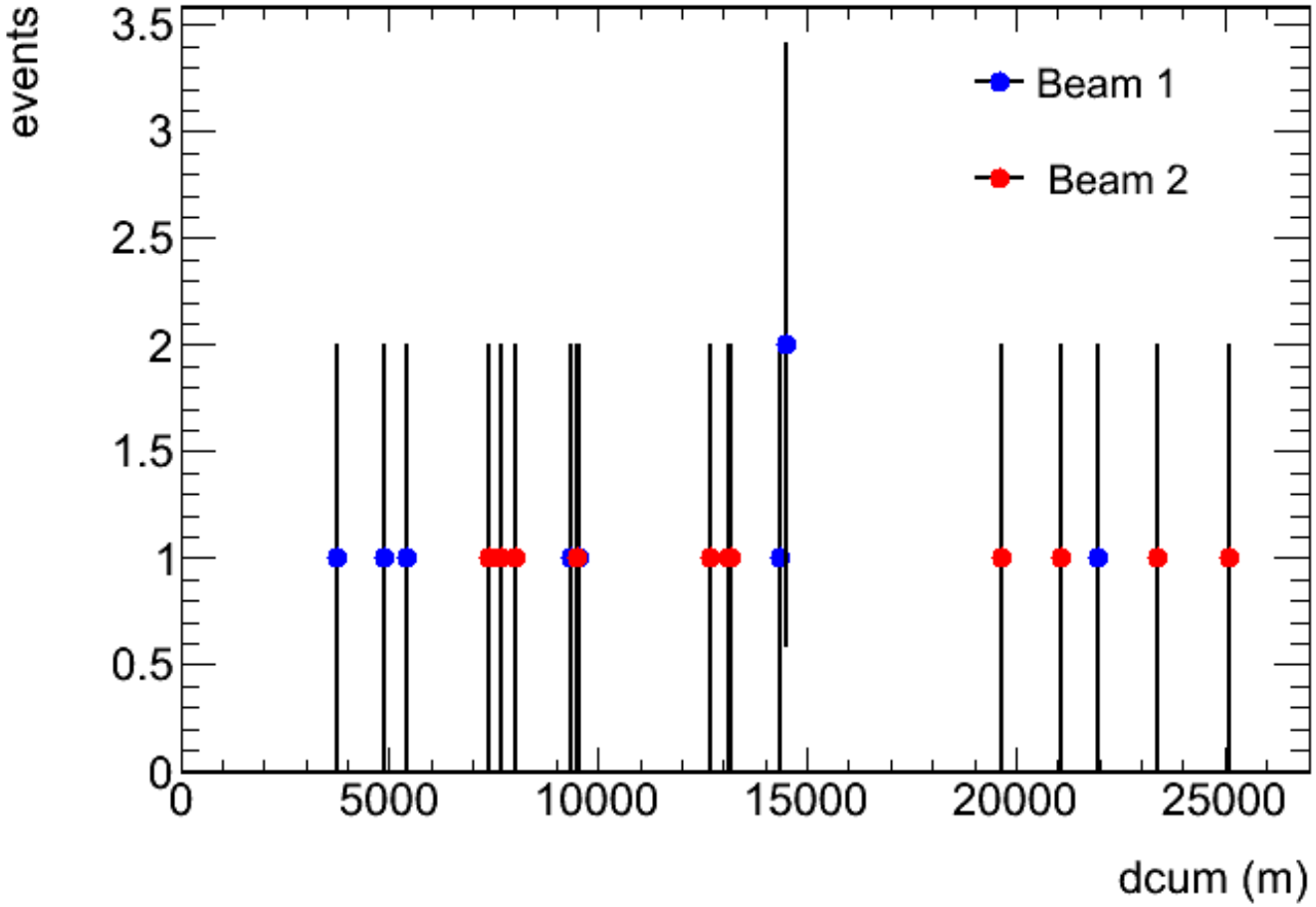
Event	Max signal Monitor	Max signal TCP Monitor	TCP/Magnet
23/08 11:50:39	BLMQI.22R3.B2E10_MQ 0.0270 Gy/s	BLMEI.06R7.B2I10_TCP.B6R7.B2 0.0310 Gy/s	1.148
26/08 15:25:57	BLMQI.25R5.B1E10_MQ 0.0352 Gy/s	BLMEI.06L7.B1E10_TCP.B6L7.B1 0.0604 Gy/s	0.439
19/08 23:34:53	BLMQI.32R2.B1I10_MQ 0.01028 Gy/s	BLMEI.06L7.B1E10_TCP.C6L7.B1 0.01094Gy/s	1.06
20/08 07:25:02	BLMQI.28R3.B2E10_MQ 0.00347 Gy/s	BLMEI.06R7.B2I10_TCP.B6R7.B2 0.00121Gy/s	0.350
20/08 07:25:48	BLMQI.25R5.B1E10_MQ 0.00882Gy/s	BLMEI.06L7.B1E10_TCP.C6L7.B1 0.00968Gy/s	1.09
20/08 11:44:50	BLMQI.23R7.B2I10_MQ 0.00312Gy/s	BLMEI.06R7.B2I10_TCP.B6R7.B2 0.00142Gy/s	0.45
23/08 04:26:47	BLMQI.26L3.B1I10_MQ 0.014 Gy/s	BLMEI.06L7.B1E10_TCP.C6L7.B1 0.00125Gy/s	0.089
23/08 09:27:24	BLMQI.22R5.B1E10_MQ 0.012 Gy/s	BLMEI.06L7.B1E10_TCP.C6L7.B1 0.00411Gy/s	0.340
24/08 17:14:13	BLMQI.12L4.B2E10_MQ 0.00802 Gy/s	BLMEI.06R7.B2I10_TCP.B6R7.B2 0.00288Gy/s	0.359
26/08 02:43:21	BLMEI.11R2.B1I10_MQ 0.00703 Gy/s	BLMEI.06L7.B1E10_TCP.C6L7.B1 0.00197Gy/s	0.280
28/08 02:43:21	BLMQI.28L8.B1E10_MQ 0.0077 Gy/s	BLMEI.06L7.B1E10_TCP.C6L7.B1 0.00330Gy/s	0.429

RATIO = (2 + 9)evts/(87.3)hours = **0.126 evts/h**

Maximum signal (RS05) distribution



Location of losses along the ring



Conclusions

- Total of 228.6 hours of stable beam have been analyzed:
    - 141.3 hours (24 bunches) ==> 0.0566 evts/hour
    - 87.3 hours (48 bunches) ==> 0.1260 evts/hour
- Losses seem to increase with intensity in frequency and Gy/s
- Losses seem to be clustered in certain regions along the ring.