



BLM Thresholds update after new loss maps: collisions and injection

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Ad-hoc BLM Thresholds Meeting

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Loss maps at injection in CHANNELING only

B1H: 2024-11-05 19:03:07

B1V: 2024-11-05 19:06:10

B2H: 2024-11-05 19:06:51

B2V: 2024-11-05 19:07:26

Proposal to increase the Thresholds for the Collimation families in Channeling by the factors in the following table **to allow for 60kW at injection:**

BLM Family Name (B1 / B2)	RS06	RS07	RS08	RS09	RS10	RS11	RS12
THRI_COLL_7_TCLA_LO_ION	0.5 / 0.2	0.7 / 0.3	0.7 / 0.3	0.5 / 0.2	0.4 / 0.1	0.4 / 0.1	0.4 / 0.1
THRI_COLL_7_TCSPM_LO_ION_H_CH	4 / 3.4	4 / 3	4 / 3	2.5 / 2	2.5 / 2	2.5 / 2	5 / 4
THRI_COLL_7_TCSPM_LO_ION_V_CH	3.1 / 3.4	2.9 / 3.2	2.9 / 3.2	1.9 / 2.1	1.9 / 2.1	1.9 / 2.1	3.8 / 4.2
THRI_COLL_7_TCSG_LO_ION_H_CH	4.2 / 3.3	3.5 / 2.8	3.5 / 2.8	2.3 / 1.8	2.3 / 1.8	2.3 / 1.8	4.5 / 3.6
THRI_COLL_7_TCSG_ME_ION_V_CH	1.4 / 1	2.2 / 1.6	2.2 / 1.6	1.4 / 1	1.4 / 1	1.4 / 1	2.6 / 1.2
THRI_COLL_7_TCSG_ME_ION_V_AM	No limit for channeling but cannot calculate factors for AM or VR						
THRI_COLL_7_TCSPM_LO_ION_H_AM	0.6 / 1.2	0.9 / 1.9	0.9 / 1.9	0.6 / 1.2	0.6 / 1.2	0.5 / 1.2	0.8 / 1.4
THRI.IP7.P1_MQTL_FT_ION_COLL	0.04 / 0.02	0.1 / 0.1	0.1 / 0.1	0.2 / 0.1	0.4 / 0.2	0.2 / 0.1	0.1 / 0.02
THRI.IP7.P2_MQTL_FT_ION_COLL	0.01 / 0.01	0.03 / 0.05	0.03 / 0.04	0.03 / 0.05	0.06 / 0.09	0.02 / 0.03	0.01 / 0.01
THRI.IP7.P2_MB_ION_COLL	0.02 / 0.02	0.05 / 0.05	0.05 / 0.05	0.06 / 0.06	0.2 / 0.2	0.1 / 0.2	0.1 / 0.1
THRI.IP7.P3_MB_ION_COLL	0.02 / 0.03	0.07 / 0.1	0.07 / 0.1	0.1 / 0.1	0.3 / 0.4	0.2 / 0.4	0.1 / 0.3
THRI.ARDS_MBMB_ION_COLL	0.004 / 0.005	0.02 / 0.02	0.02 / 0.02	0.02 / 0.02	0.05 / 0.05	0.02 / 0.02	0.01 / 0.01
THRI.ARDS.P1_MQ_ION_COLL	0.01 / 0.01	0.03 / 0.01	0.03 / 0.01	0.03 / 0.02	0.08 / 0.04	0.05 / 0.02	0.03 / 0.01

60 kW at injection is equivalent to a minimum lifetime of ~0.005 h

Loss maps at injection in CHANNELING only

Factors for additional BLMs not in dedicated families: propose NOT to change

BLM Family Name (B1 / B2)	RS06	RS07	RS08	RS09	RS10	RS11	RS12
THRI_ALICE BLMEI.01L2.B1E10_MBWMD	-	1.9	-	-	-	-	-
BLMTI.04R7.B2I10_TCSPM.D4R7.B2	-	1.2	1.2				
BLMQI.03R8.B2E30_MQXA	-	-	-	-	1.3	1.1	-

THRI_ALICE -> could be noise or due to the Injection Protection In. Only in RS07.

BLMQI.03R8.B2E30_MQXA -> Monitor factor is set already to MF = 1

Limitation start of ramp: Q8R3 with possibly non-conform bypass diode -> The thresholds were increased by 30% in the longer running sums in 2023, which was considered acceptable by MP3

Latest discussions towards a further increase of a factor of 2 in RS08-RS12 for Energy levels 01-03 -> Up to 740 GeV

Already in dedicated ion family THRI.ARDS.P3_MQ_CRIT_ION_IR3, monitor factor MF = 0.1

Loss maps at top energy: CH/AM/VR combined

Proposal updated as discussed in MPP on Monday 4th Nov.

BLM Family Name	RS06	RS07	RS08	RS09	RS10	RS11	RS12
THRI_COLL_7_TCSG_ME_ION_V_AM	0.3	0.6	0.6	0.4	0.4	0.4	0.4
THRI_COLL_7_TCSPM_LO_ION_H_AM	1.1	1.7	1.7	1.1	1.1	1.1	1.1
THRI.IP7.P2_MB_ION_COLL	-	1.5	1.2	1.3	1.4	1.5	1.5
THRI.IP7.P3_MB_ION_COLL	-	1.6	1.3	-	-	-	-
THRI.ARDS_MBMB_ION_COLL	-	1.3	1.2	-	-	-	-
THRI.ARDS.P1_MQ_ION_COLL	-	1.7	1.3	1.3	1.7	1.5	1.5

New bottleneck in DS for RS07-RS11 (Q8) THRI.ARDS.P3_MQ appeared in the last loss maps which needs a factor below 2 (similar to what is already in place for THRI.ARDS.P1_MQ_ION_COLL)

New family is needed: **THRI.ARDS.P3_MQ_ION_COLL** -> Created by Maciej yesterday

BLM Name	RS06	RS07	RS08	RS09	RS10	RS11	RS12
BLMQI.08L7.B2I30_MQ	-	1.9	1.4	1.3	2.2	1.1	-
BLMQI.08R7.B1E30_MQ							

BLM Thresholds proposal for the 2024 Ion Run

Power loss limits for the **master thresholds** RS09 (1.3 s) at top energy with the dedicated ion families

BLM Family Name	Power Loss Limit Channeling B1 / B2 [kW]	Power Loss Limit Amorphous B1 / B2 [kW]	Power Loss Limit Volume Reflexion B1 / B2 [kW]
THRI_COLL_7_TCLA_LO_ION	113 / 130	20 / 25	30 / 40
THRI_COLL_7_TCSPM_LO_ION_H_CH	70 / 70	330 / 520	220 / 420
THRI_COLL_7_TCSPM_LO_ION_V_CH	60 / 60	110 / 200	70 / 80
THRI_COLL_7_TCSG_LO_ION_H_CH	55 / 70	260 / 300	150 / 220
THRI_COLL_7_TCSG_ME_ION_V_CH	60 / 70	300 / 370	340 / 540
THRI_COLL_7_TCSG_ME_ION_V_AM	220 / 430	16 / 24	20 / 24
THRI_COLL_7_TCSPM_LO_ION_H_AM	84 / 110	20 / 21	13 / 15
THRI.IP7.P1_MQTL_FT_ION_COLL	240 / 460	40 / 90	60 / 130
THRI.IP7.P2_MQTL_FT_ION_COLL	300 / 400	55 / 90	80 / 110
THRI.IP7.P2_MB_ION_COLL	78 / 156	13 / 26	26 / 39
THRI.IP7.P3_MB_ION_COLL	140 / 100	20 / 20	30 / 40
THRI.ARDS_MBMB_ION_COLL	170 / 100	20 / 20	40 / 40
THRI.ARDS.P1_MQ_ION_COLL	182 / 91	18 / 13	33 / 20

IR7 collimators

IR7 Q6

IR7 DS