



Loss Map Validation

MD12663

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On behalf of the LHC Collimation and OP teams

Outline

- 1 Introduction
- 2 Summary plots of betatron LMs
- 3 All Loss Maps

MD12663 Wire compensation during the β^* -leveling

Main changes in configuration:

- Wire ON during the β^* -leveling from 41-30 cm, not only at 30 cm
- Crossing angle reduces from 150 to 130 urad at 30 cm
- Tighter collimator settings: Once at 130 urad, the secondaries gap and TCDQ will be reduced by 0.5σ and the tertiary by 1σ

Loss Maps Validation Matrix

Validation test	Loss Maps Matrix						
	β^* (cm)						
	41.5	38.5	35.5	32.5	30.0	30.0	30.0
	Xing (μ rad)						
	160	160	160	160	130	130	130
	Collimator settings						
	Nominal	Nominal	Nominal	Nominal	Nominal	Tight	Tight
	BBLR						
ON	ON	ON	ON	ON	ON	OFF	
B1H	X	X	X	X	X	X	X
B1V	X	X	X	X	X	X	X
B2H	X	X	X	X	X	X	X
B2V	X	X	X	X	X	X	X
+dp/p	X					X	
-dp/p	X					X	
ASD						X	

Courtesy of D. Mirarchi.

Validation Summary

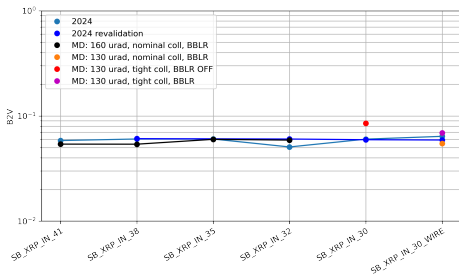
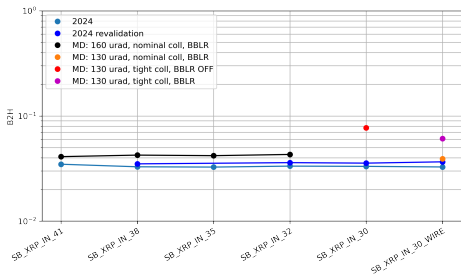
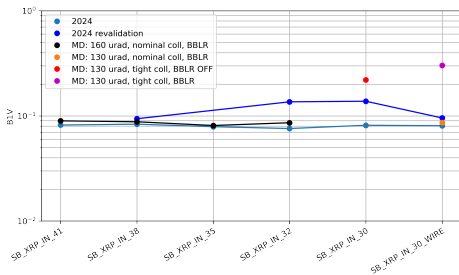
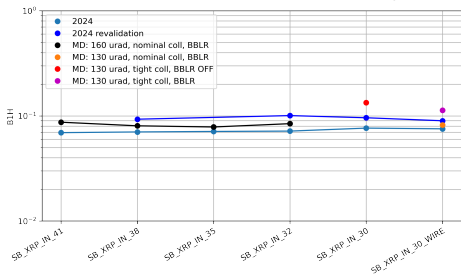
- **No showstopper** for validation with the MD trains
- β^* -leveling 41.5-30 cm with BBLR ON looks normal
- IR7 looks good even with the tighter settings: no hierarchy breakage, some increase in the hierarchy factor (strongest on B1V)
- Increased losses on the TCT1/5 in the betatron loss maps (expected due to higher settings)
- Off-momentum loss maps also look good

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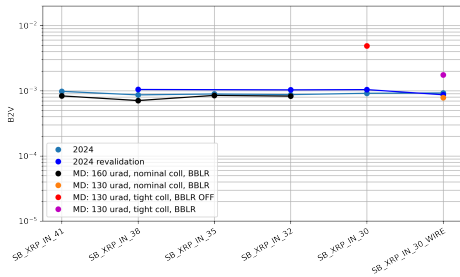
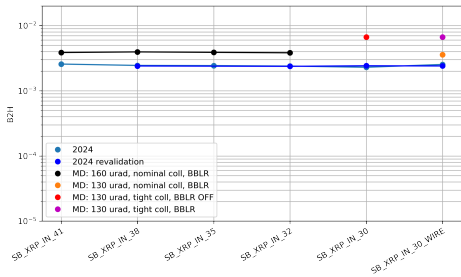
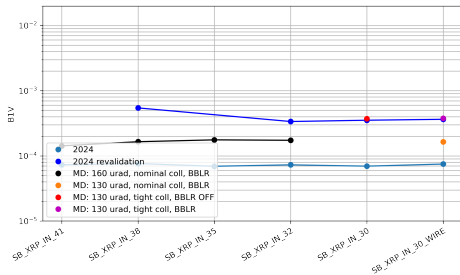
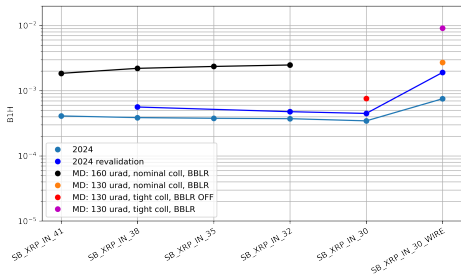
Hierarchy Factor

Maximum secondary collimator loss in IR7 (downstream of IP)



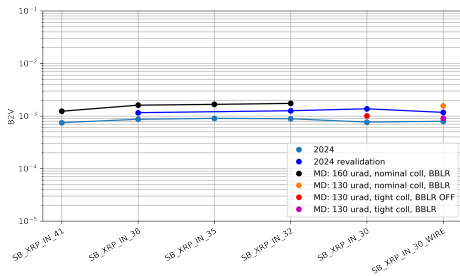
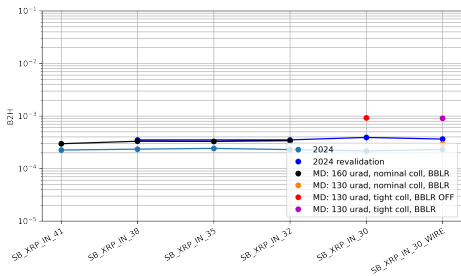
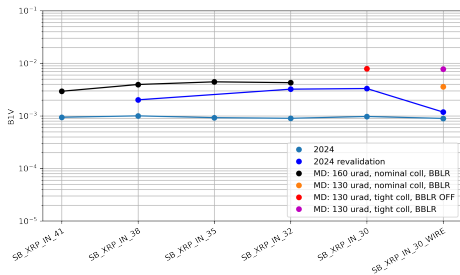
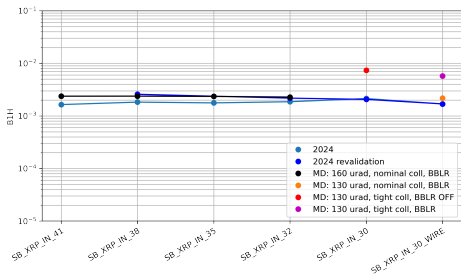
TCSP losses

Normalised losses on the TCSP



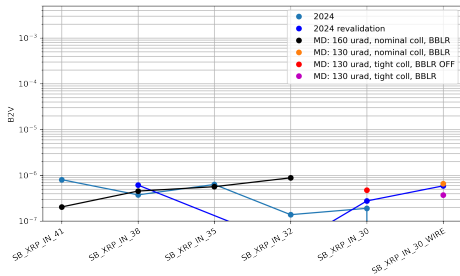
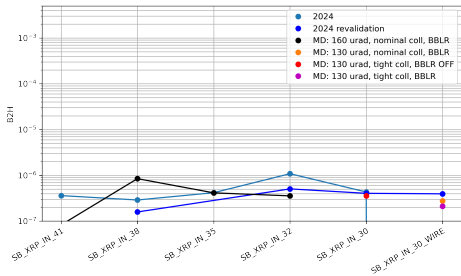
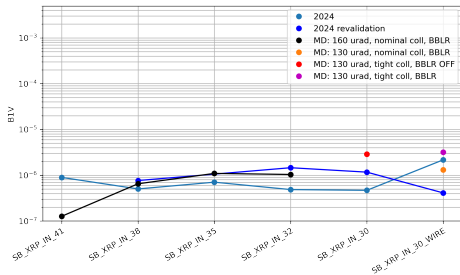
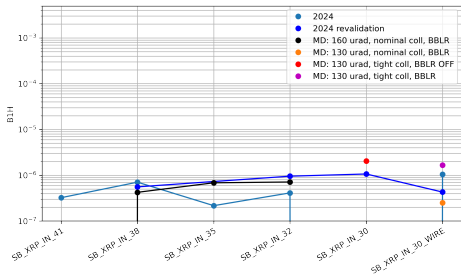
TCT losses in IP1

Normalised losses on the TCT in IP1



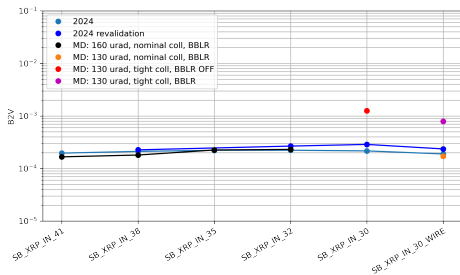
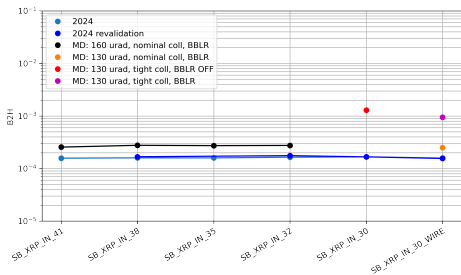
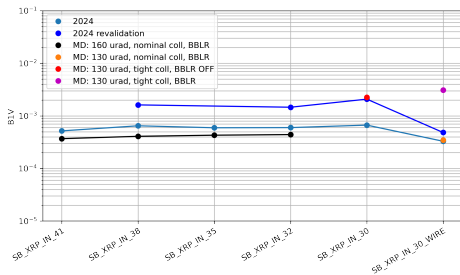
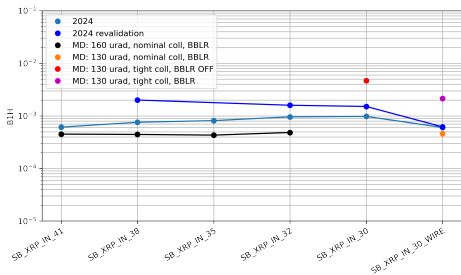
TCT losses in IP2

Normalised losses on the TCT in IP2



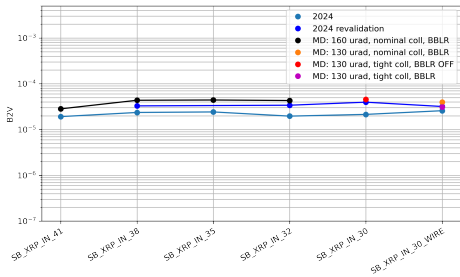
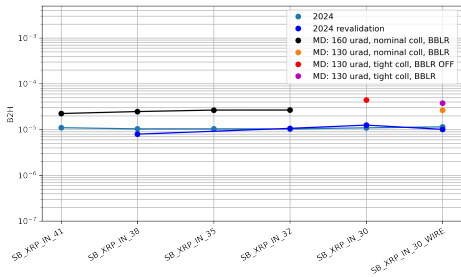
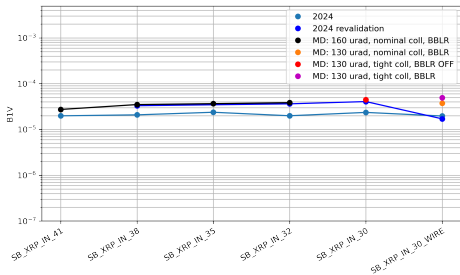
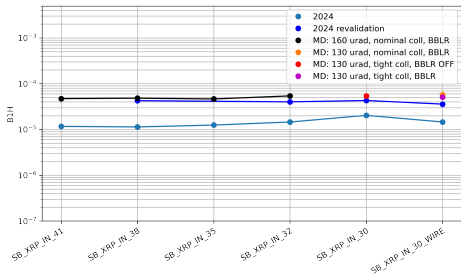
TCT losses in IP5

Normalised losses on the TCT in IP5



TCT losses in IP8

Normalised losses on the TCT in IP8



Outline

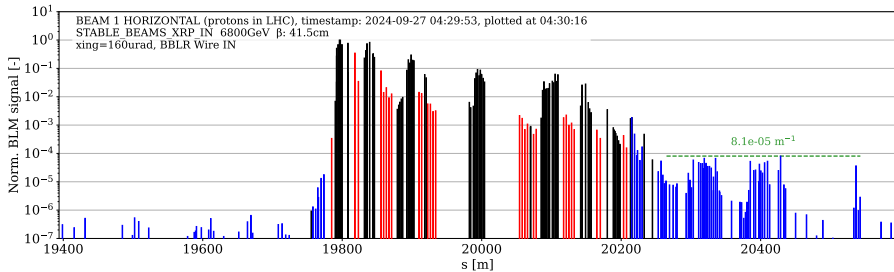
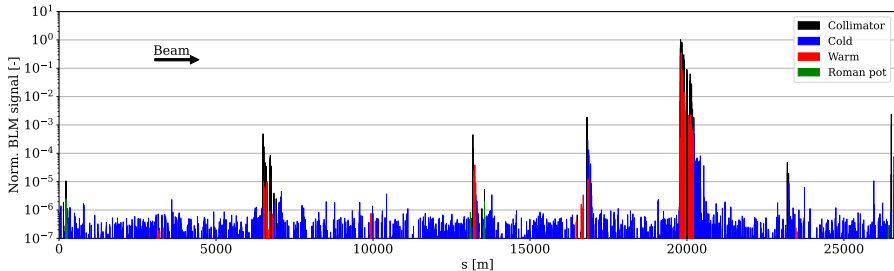
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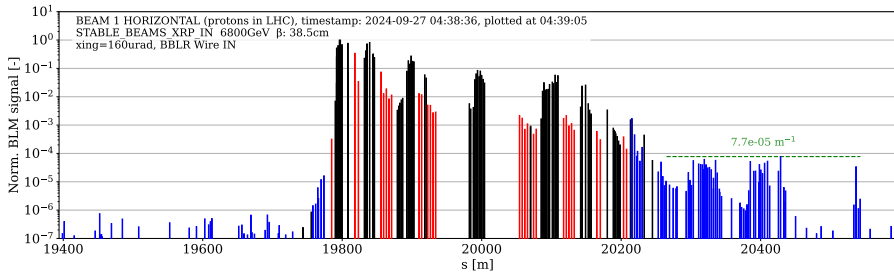
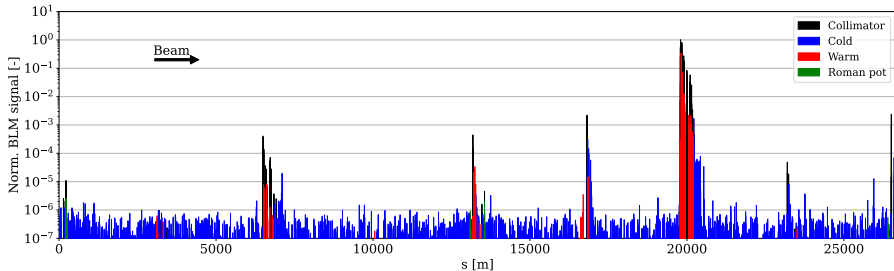
All Loss Maps

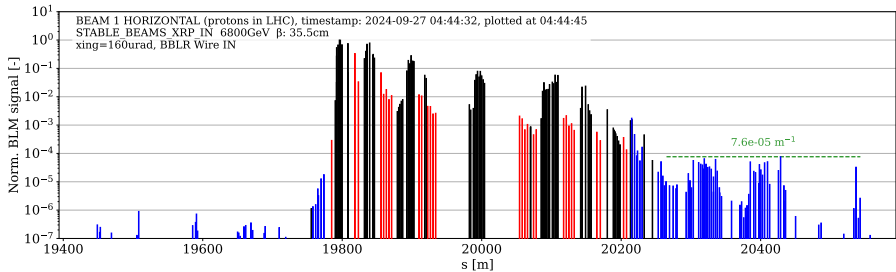
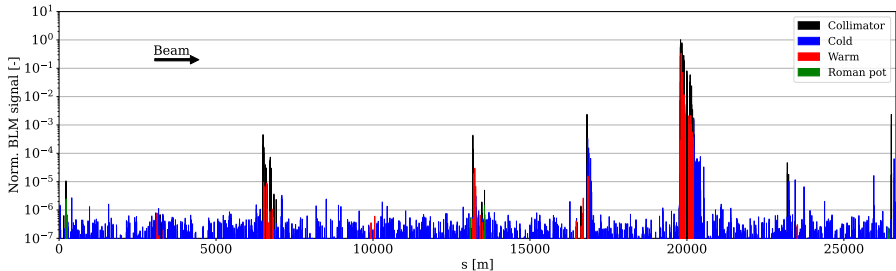
4 Colliding Loss Maps - XRP IN

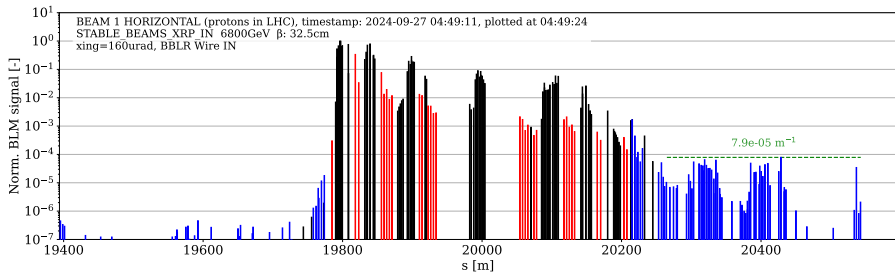
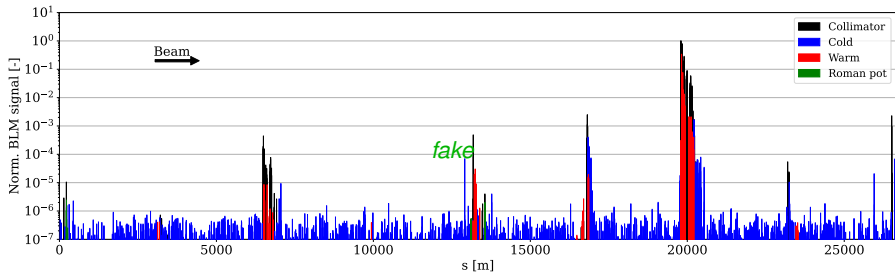
- B1H
- B1V
- B2H
- B2V
- $+\frac{\delta p}{p}$
- $-\frac{\delta p}{p}$
- Async Dump

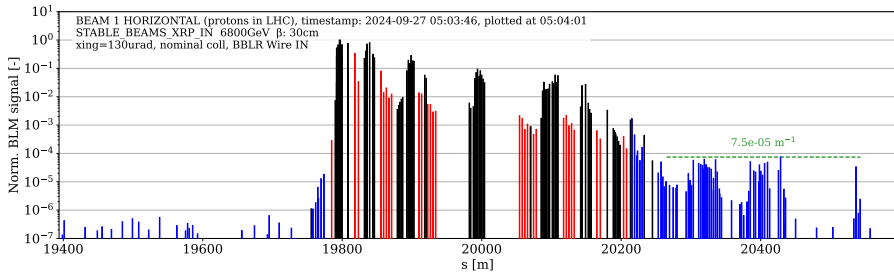
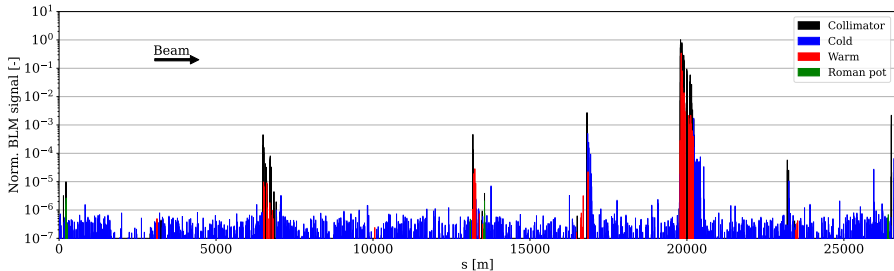
B1H

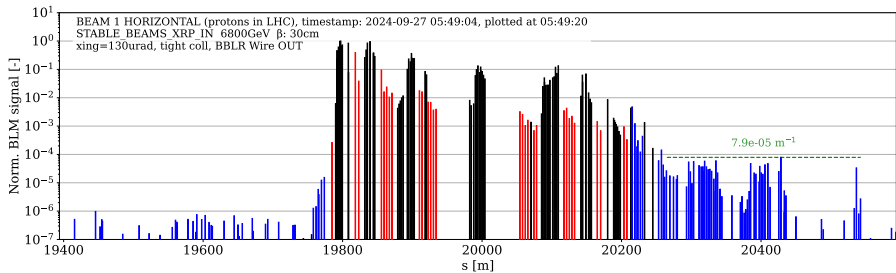
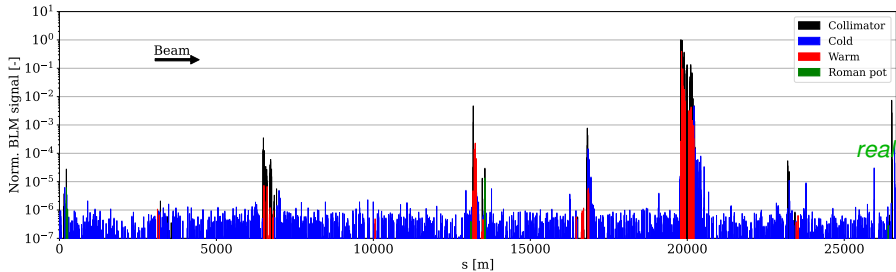


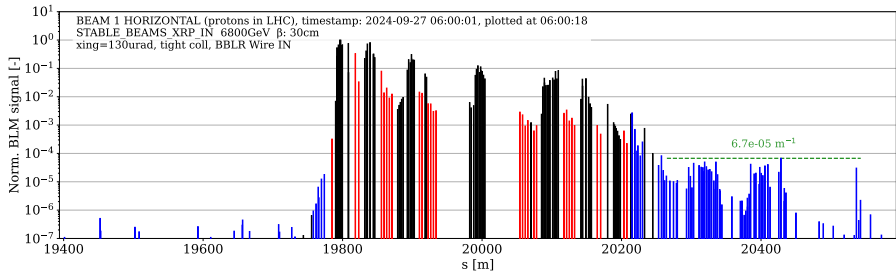
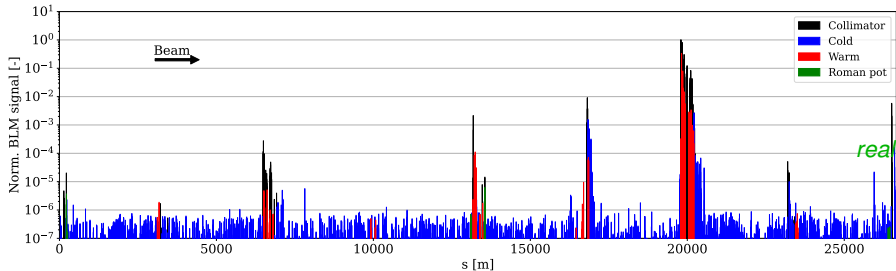










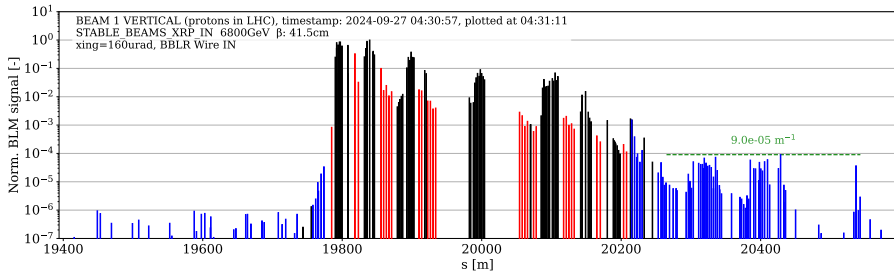
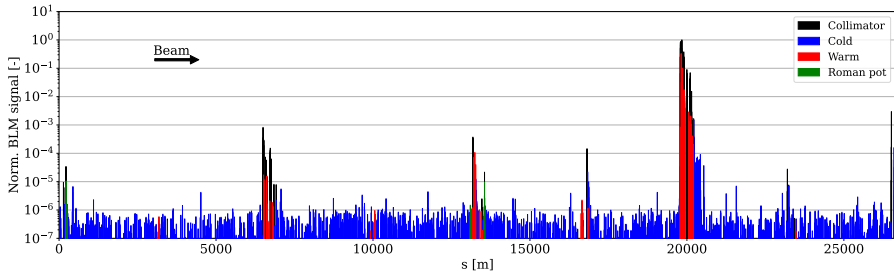


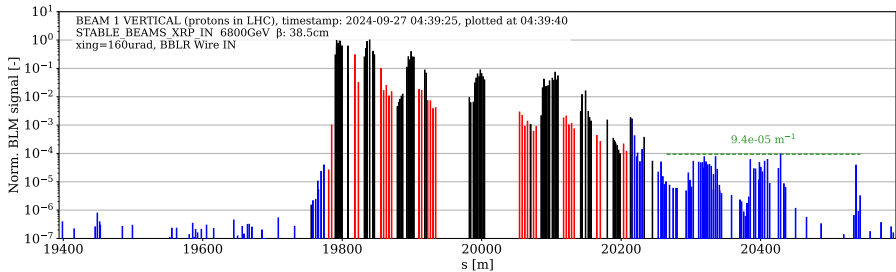
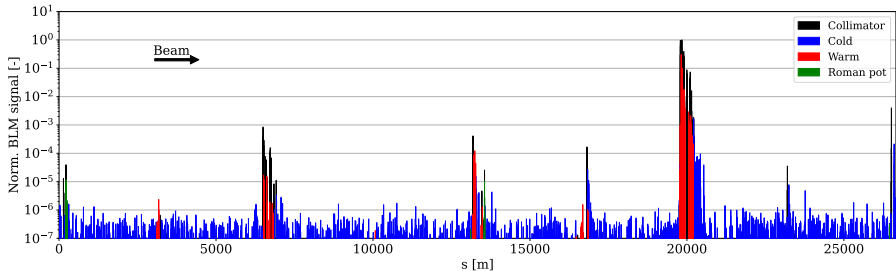
All Loss Maps

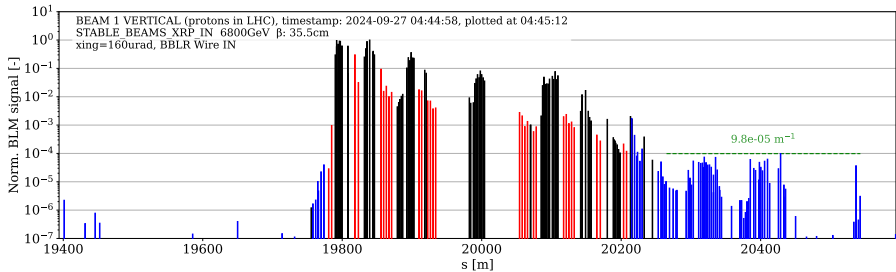
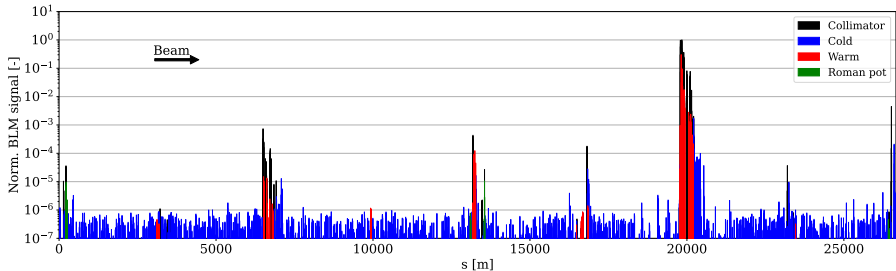
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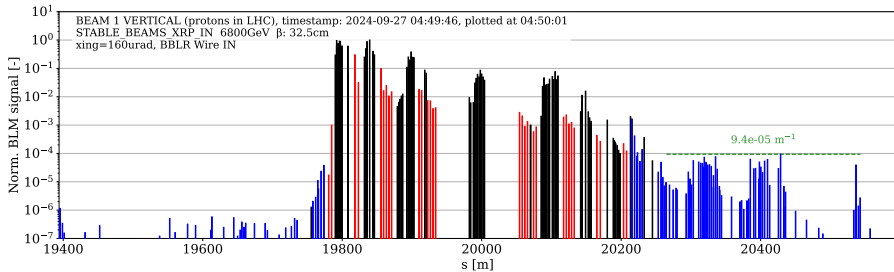
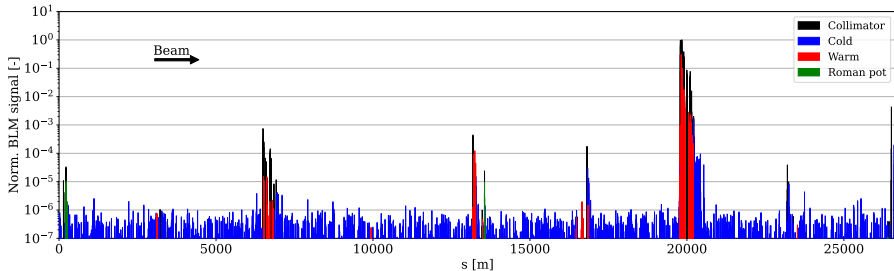
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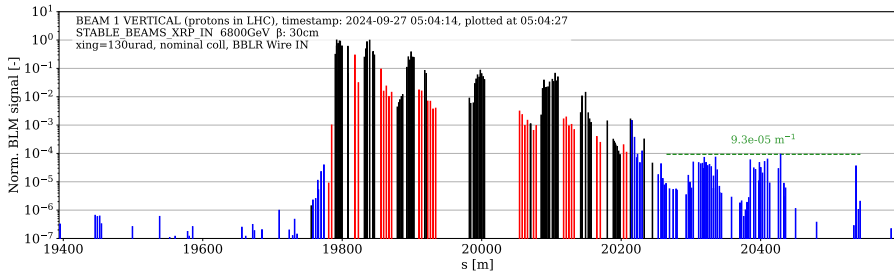
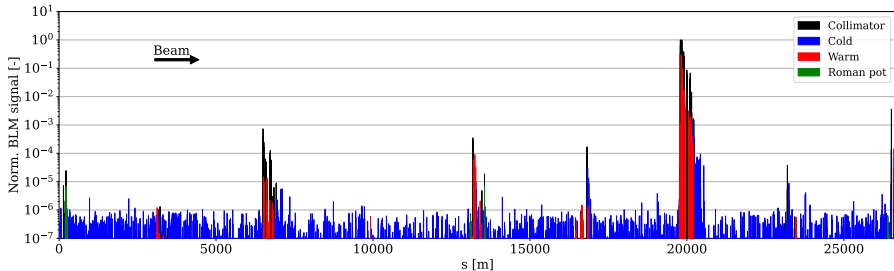
B1V

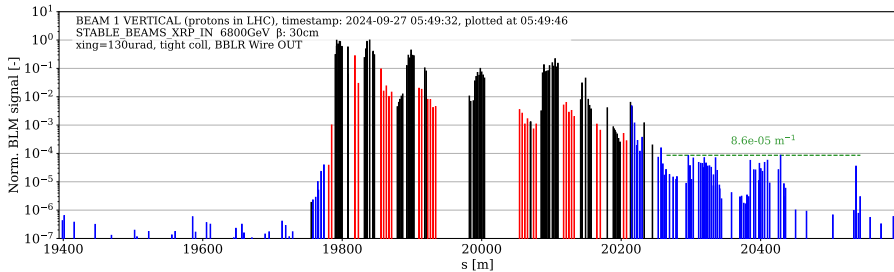
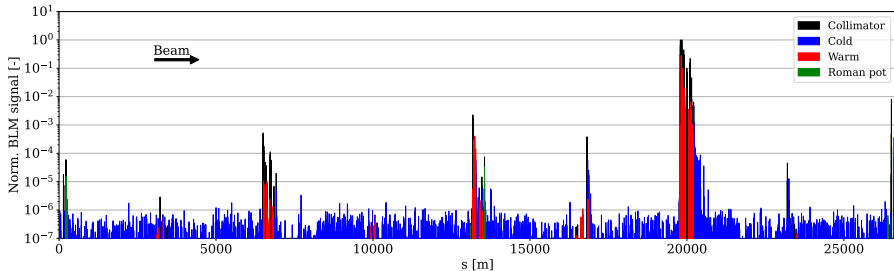


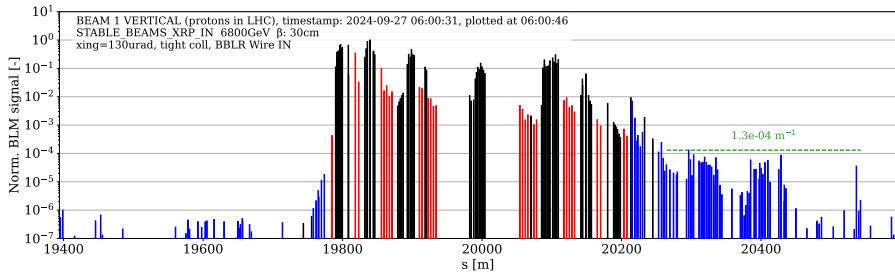
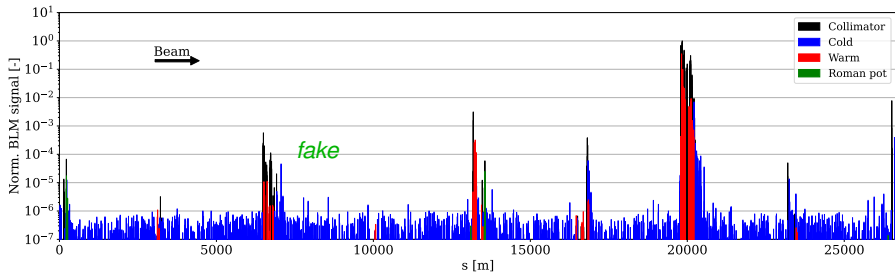










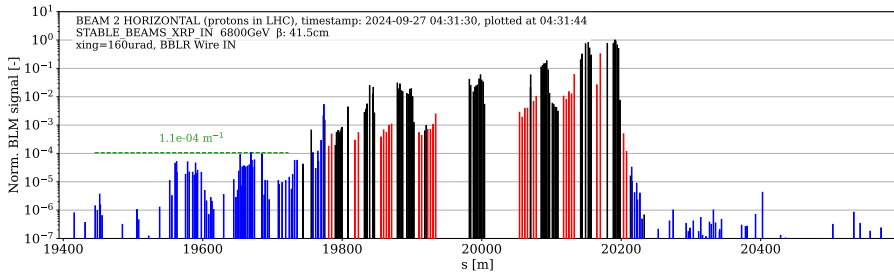
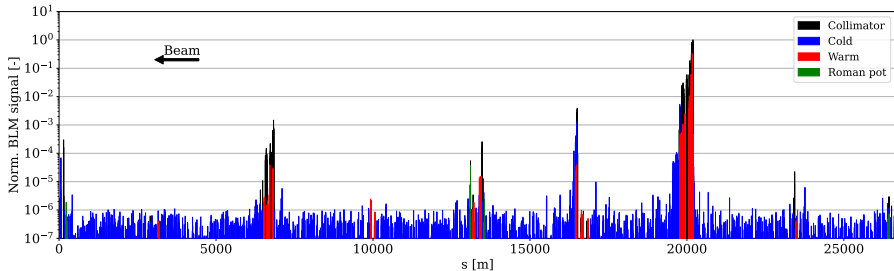


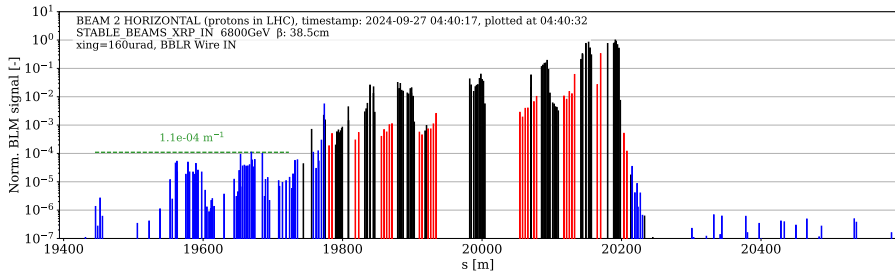
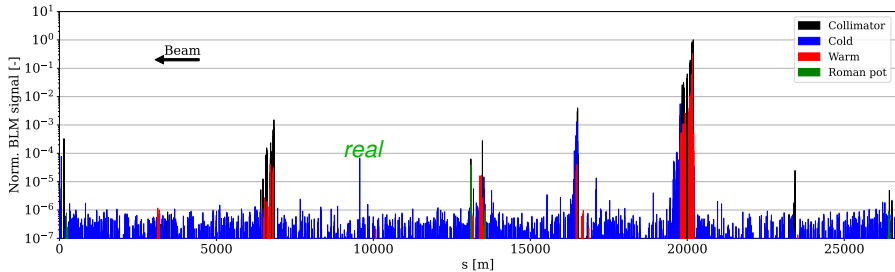
All Loss Maps

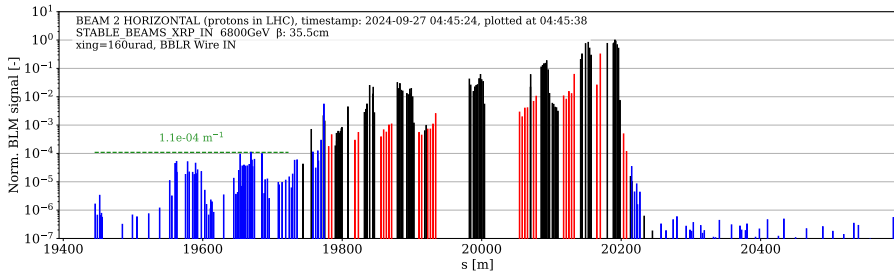
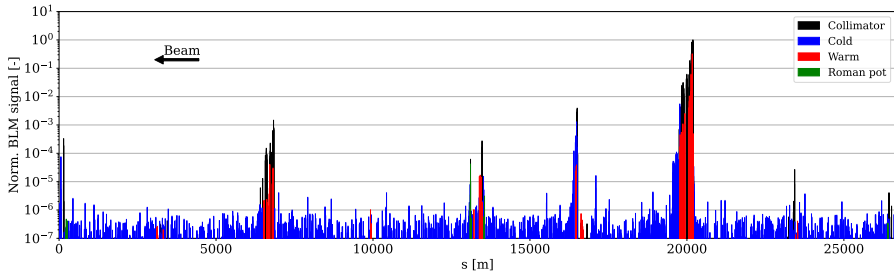
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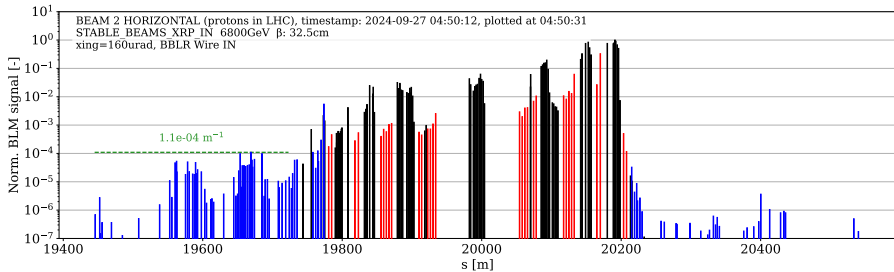
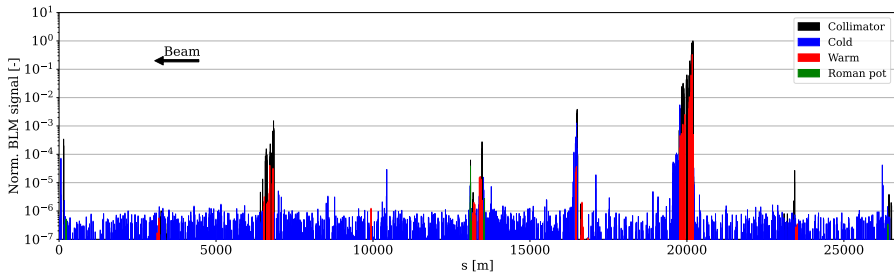
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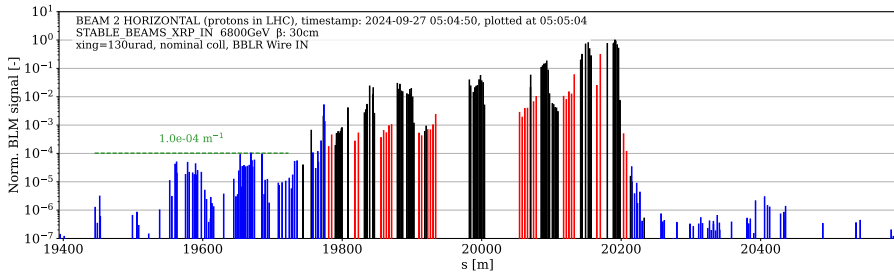
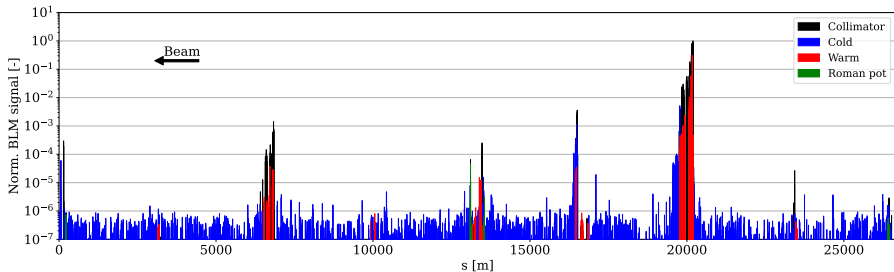
B2H

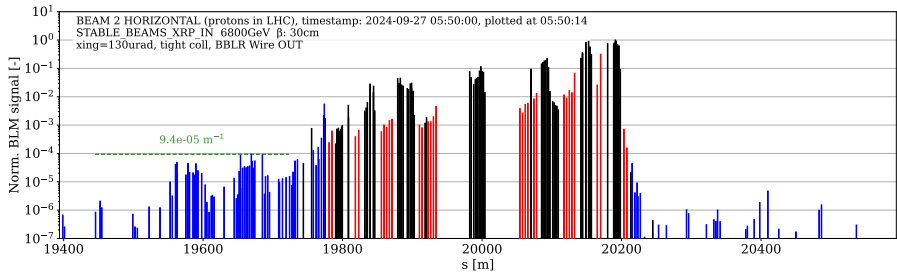
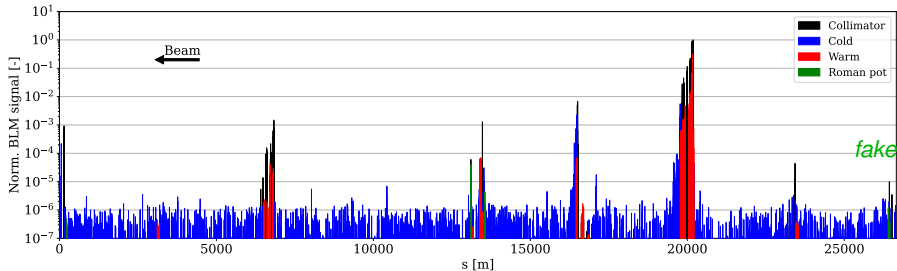


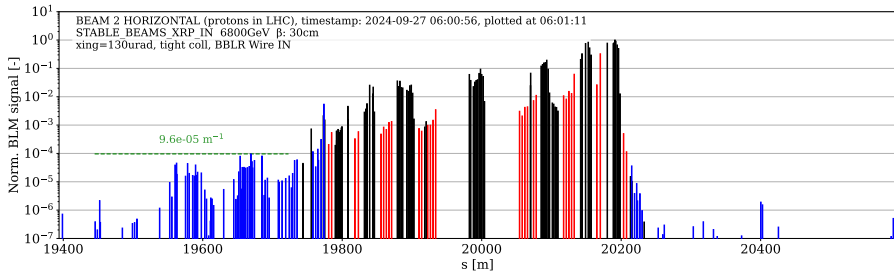
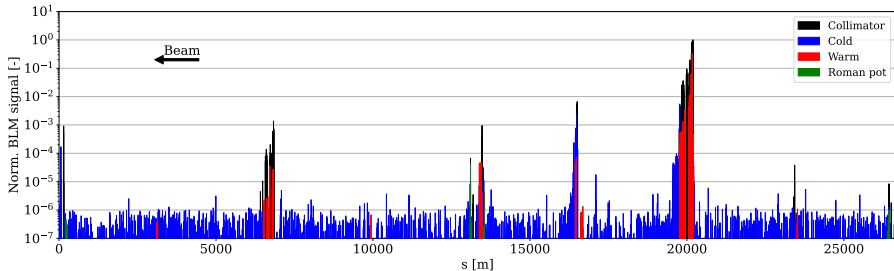










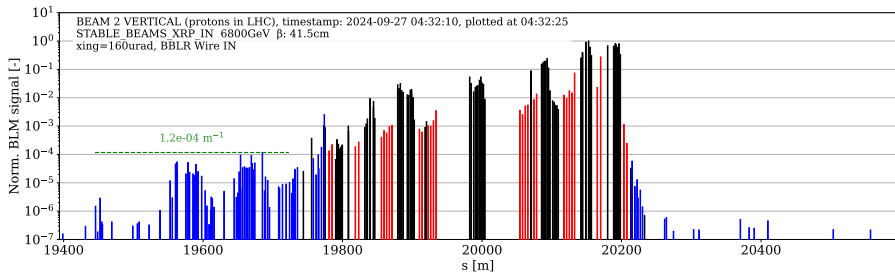
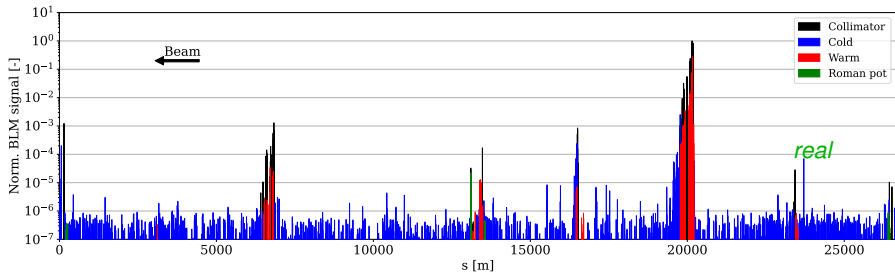


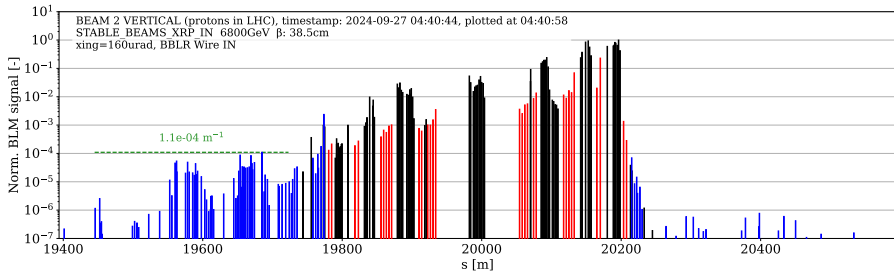
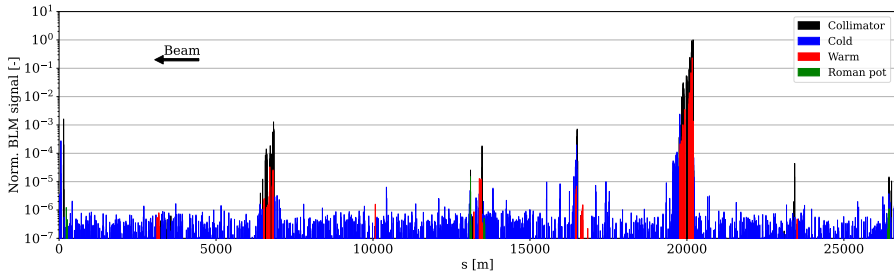
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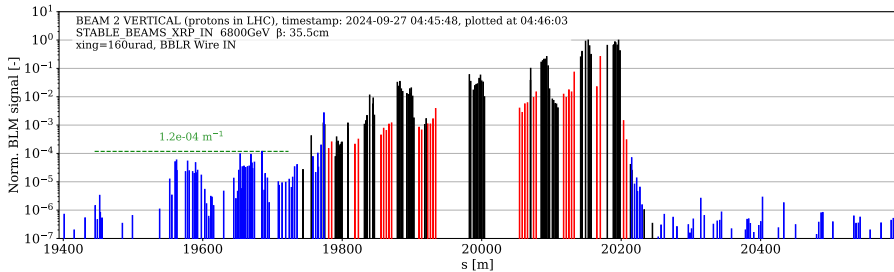
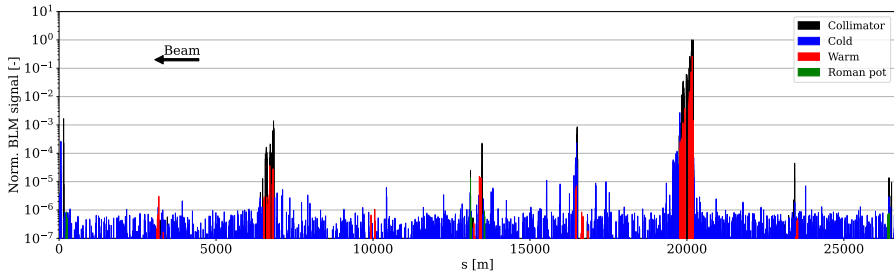
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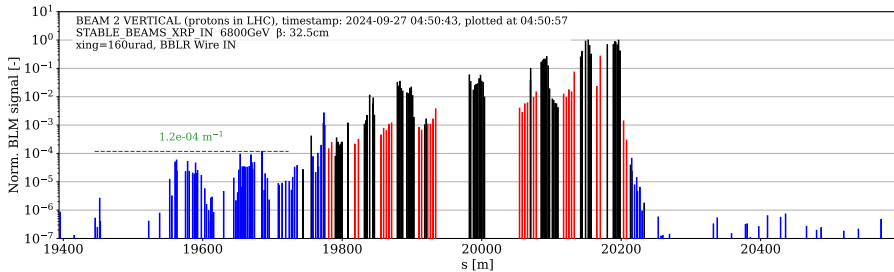
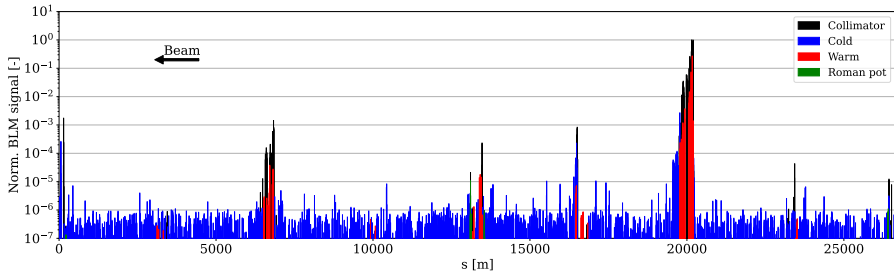
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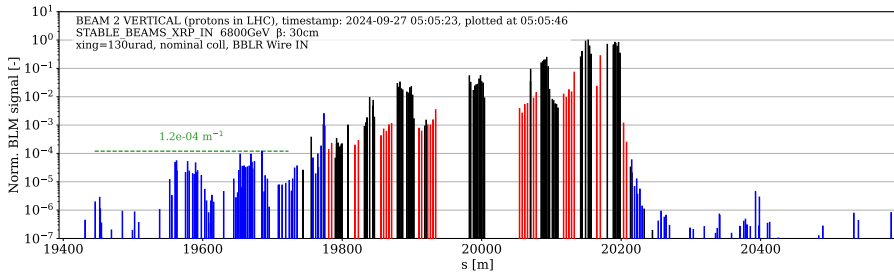
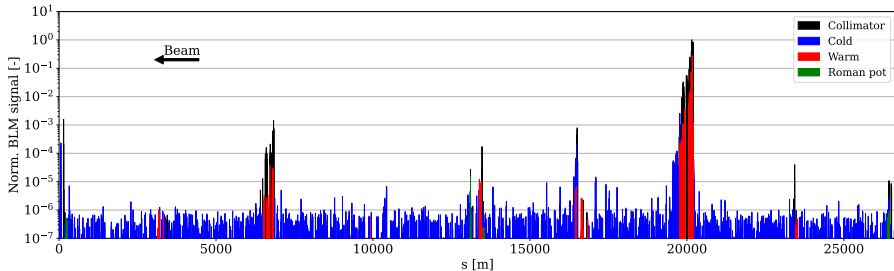
B2V

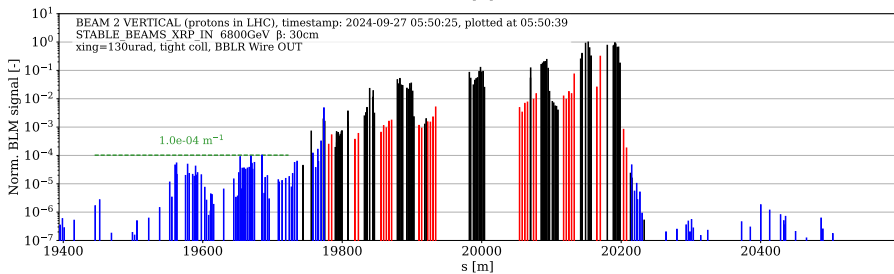
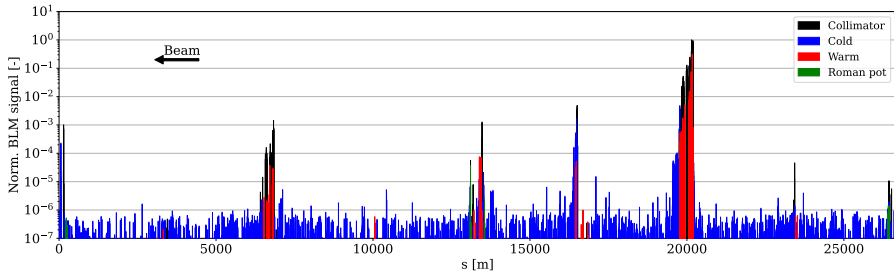


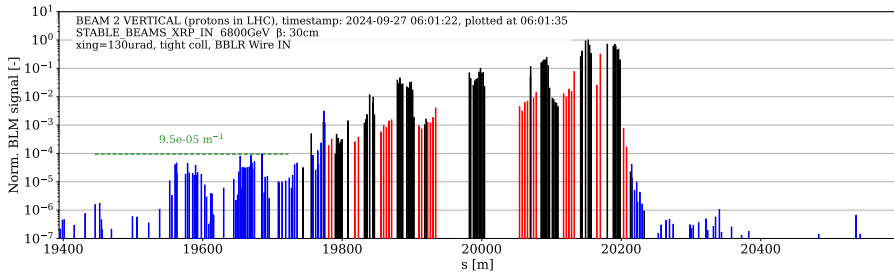
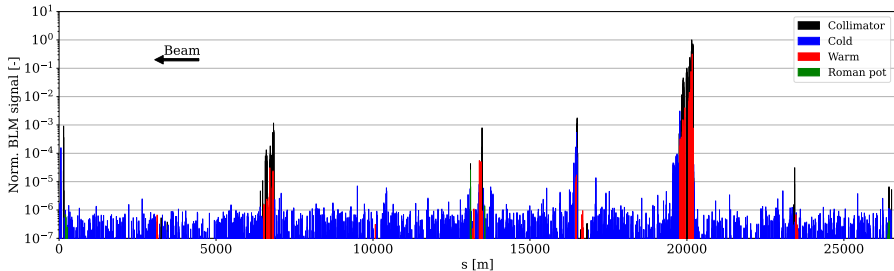










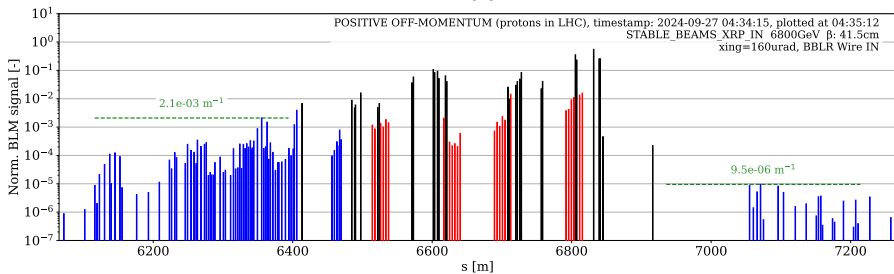
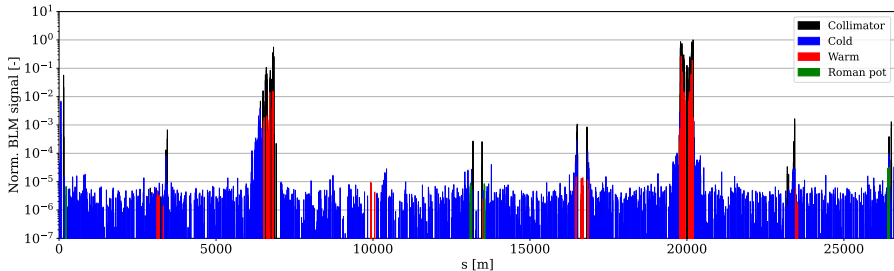


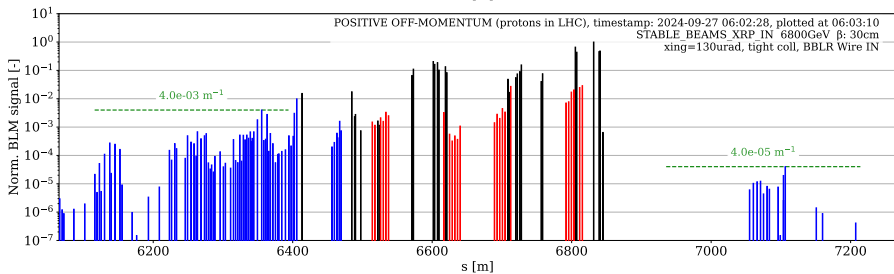
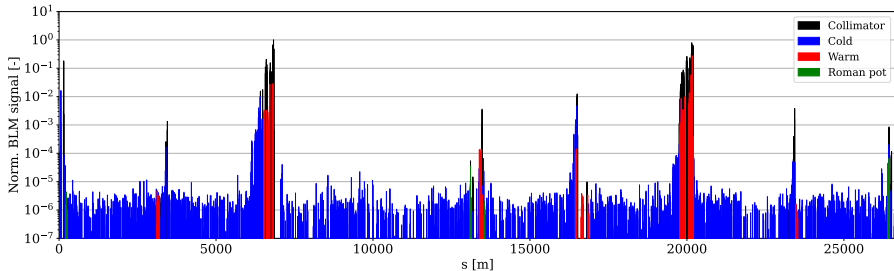
All Loss Maps

4 Colliding Loss Maps - XRP IN

- B1H
- B1V
- B2H
- B2V
- $+\frac{\delta p}{p}$
- $-\frac{\delta p}{p}$
- Async Dump

$$+\frac{\delta p}{p}$$



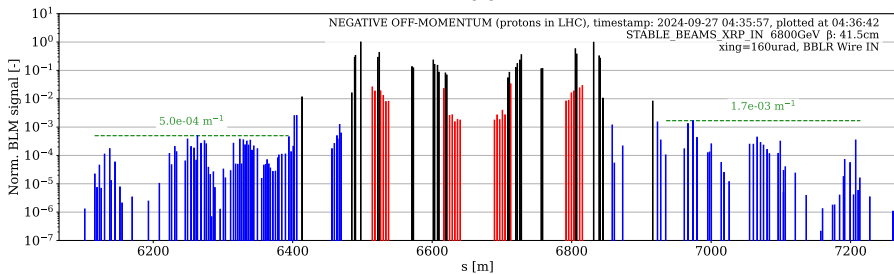
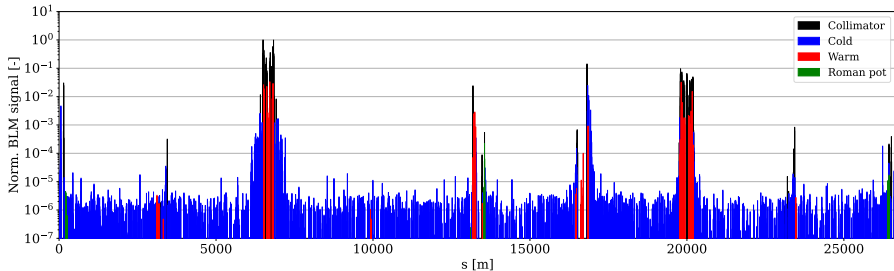


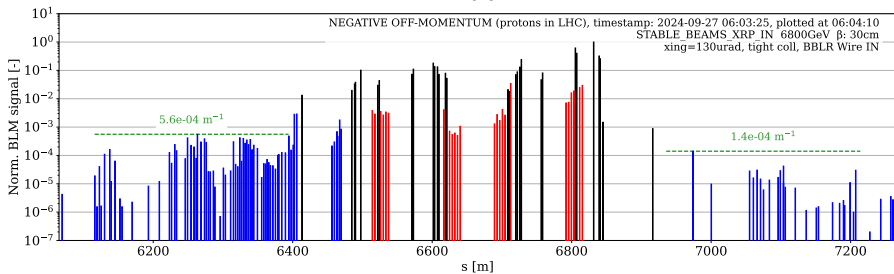
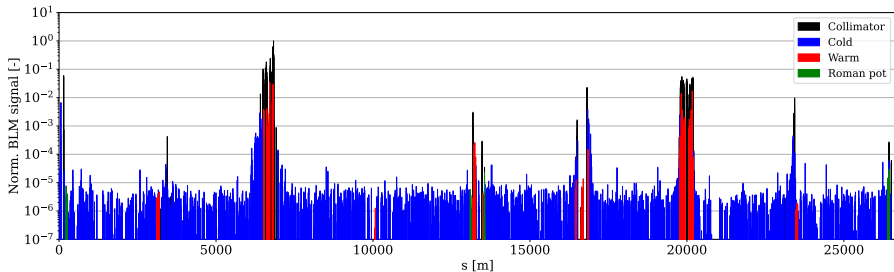
All Loss Maps

4 Colliding Loss Maps - XRP IN

- B1H
- B1V
- B2H
- B2V
- $+\frac{\delta p}{p}$
- $-\frac{\delta p}{p}$
- Async Dump

$$\frac{\delta p}{p}$$





All Loss Maps

4 Colliding Loss Maps - XRP IN

- B1H
- B1V
- B2H
- B2V
- $+\frac{\delta p}{p}$
- $-\frac{\delta p}{p}$
- Async Dump

