



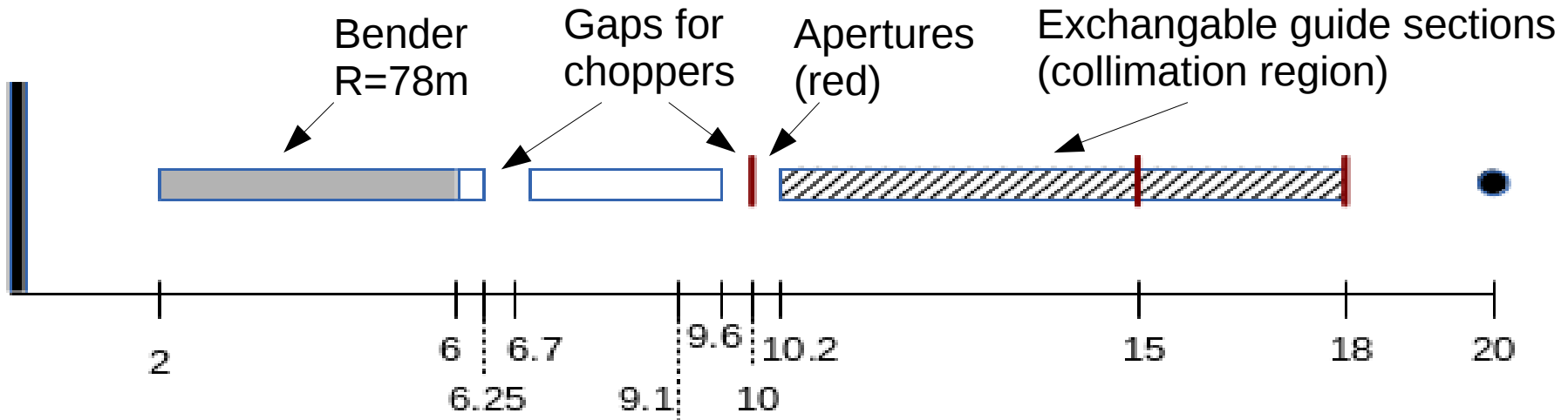
EUROPEAN  
SPALLATION  
SOURCE

# Loki guide (& chopper) simulations summary

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[www.europeanspallationsource.se](http://www.europeanspallationsource.se)  
September, 2014

# Reminder: guide in proposal



Avoids line-of-sight 1x at 6.8m from source

Now:

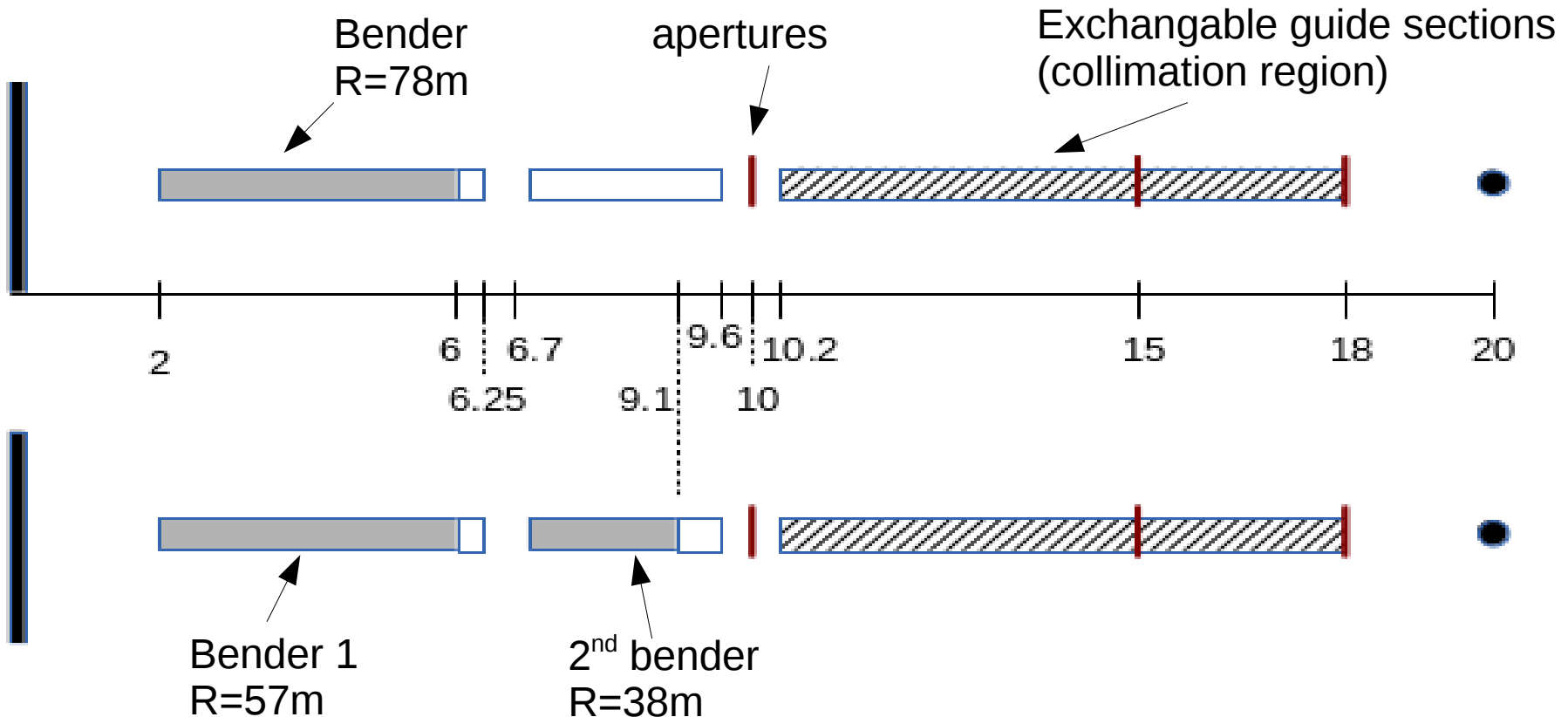
- How would avoiding line-of-sight twice influence the performance?

Target wavelength: 3A

Wavelength range of interest: 2-22A

Target divergence: up to  $\pm 0.6^\circ$

# Adjustment to 2xLoS

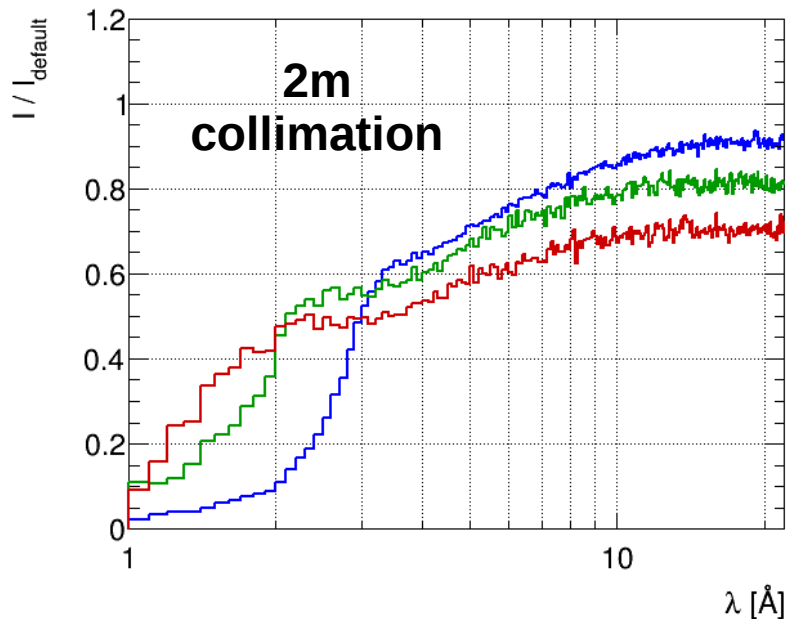


Avoids line-of-sight 1x at 6m from source, 2x at 9.6m from source

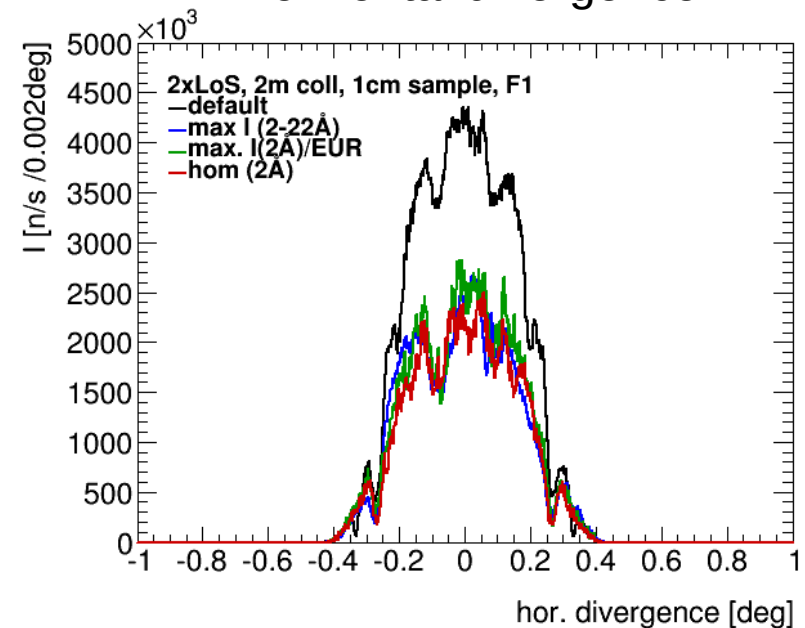
# Comparison of 2nd line-of-sight vs 1x LoS (proposal=default)

option	optimized wavelength	Bender 1			Bender 2			sum k€	
		m	N	k€	m	N	k€		
1	2-22 Å	6	1	59	3	5	75	same curv.	134
2	3 Å	6	1	59	3	9	126	s-bender	185
3	2 Å	6	2	99	3	10	139	s-bender	238
default		4	4	162	-	-	-		162

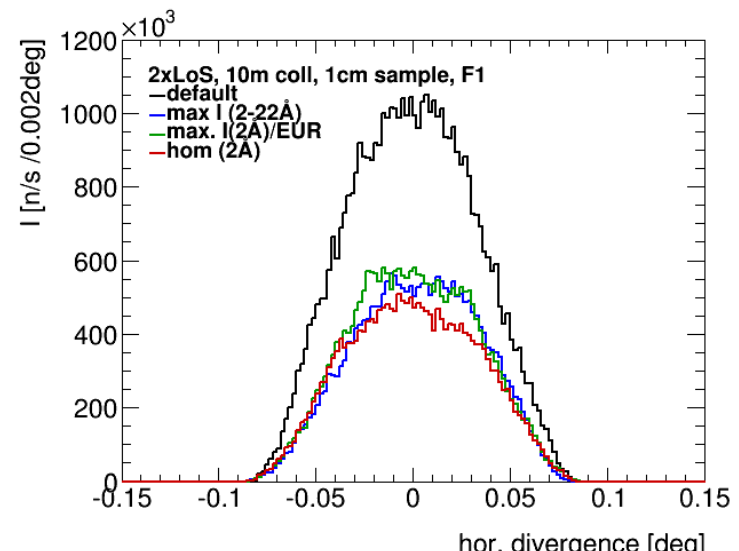
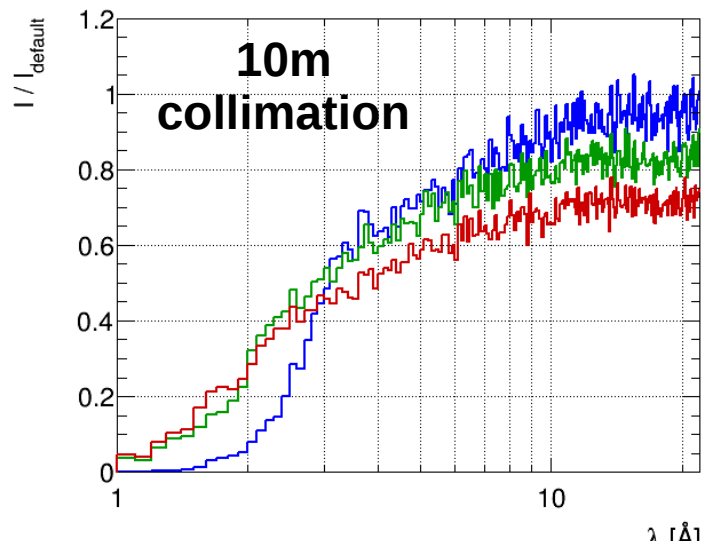
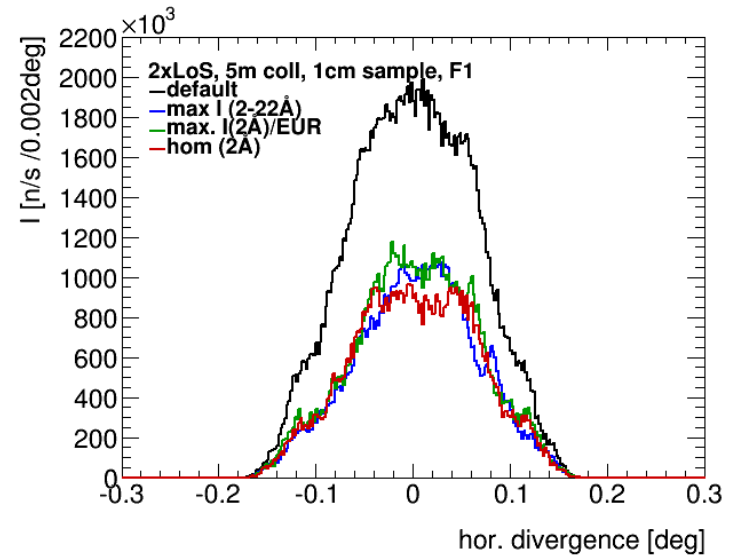
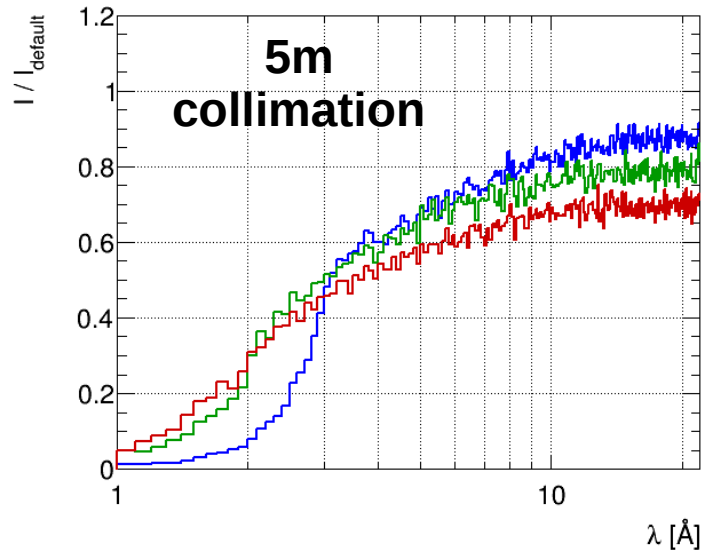
Spectrum 2xLoS / proposal



Horizontal divergence

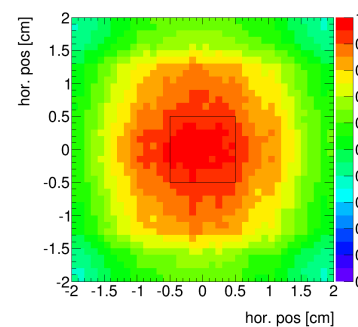
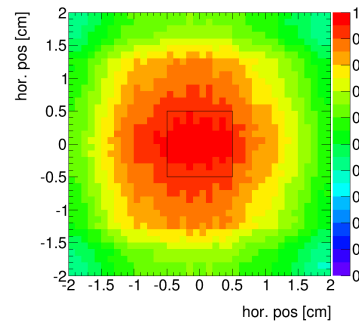
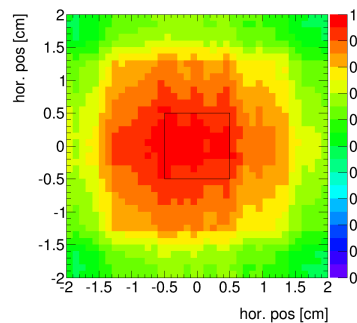
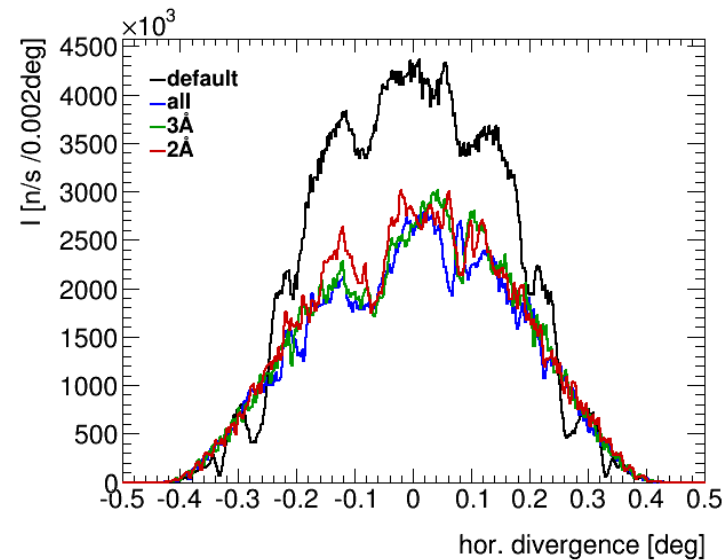
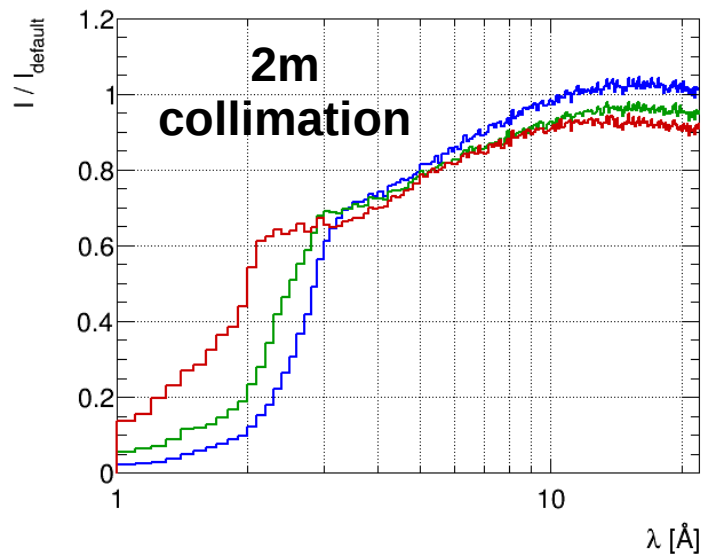


# Comparison of 2nd line-of-sight vs 1x LoS (proposal=default)



# Focussing end section

Performance with 2m collimation can be improved by focussing end section:  
Last 3m are elliptically focussing

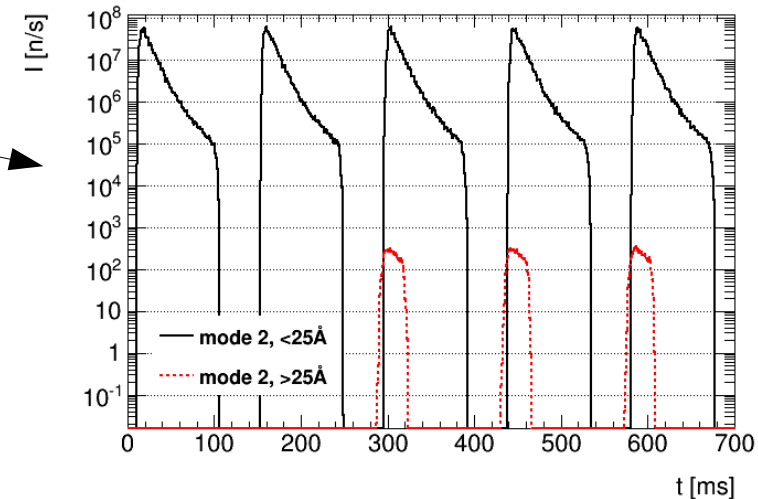
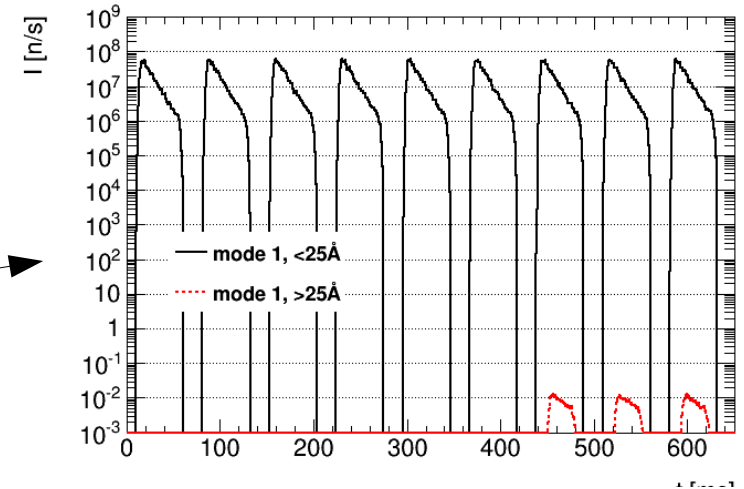
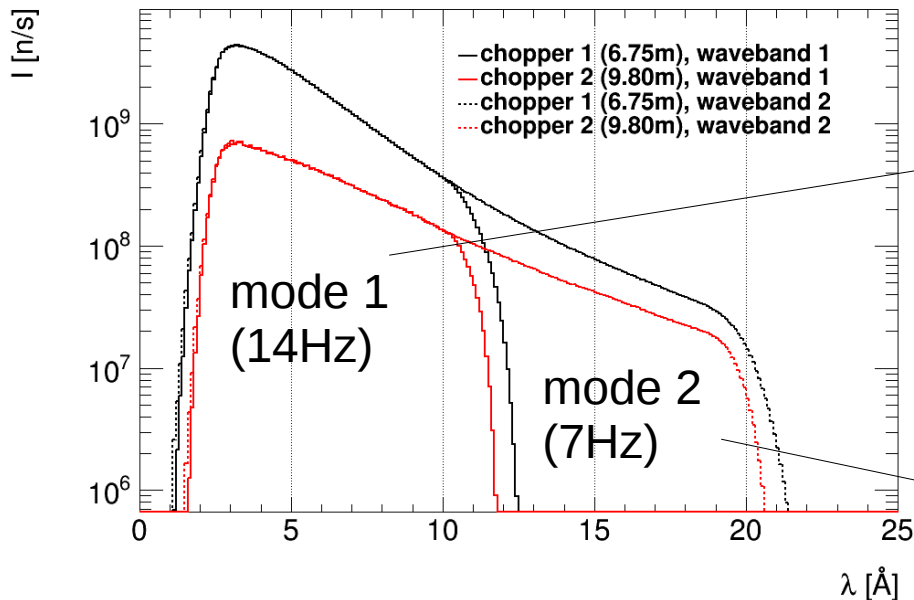


- S-bender vs curvature in one direction (vs 1xLoS)
  - ✓ No performance issue with s-bender
  - ✓ Horizontal displacement of sample position much smaller with s-bender (35cm vs 190 cm, compared to 2 benders curved in same direction)
    - × But not 0: Inclination of whole beamline to end up at 0° costs about 5% intensity on average
- Shielding constraints not clear yet

# Chopper simulation: check possible frame overlap

2 double-choppers at 6.75m and 9.75m, R=35cm

operation modes:

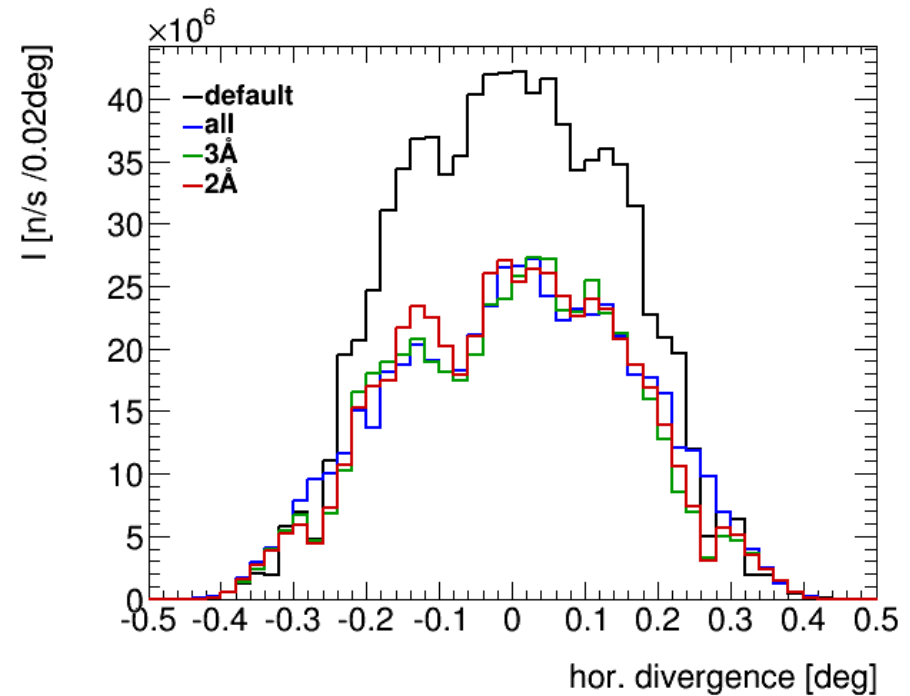
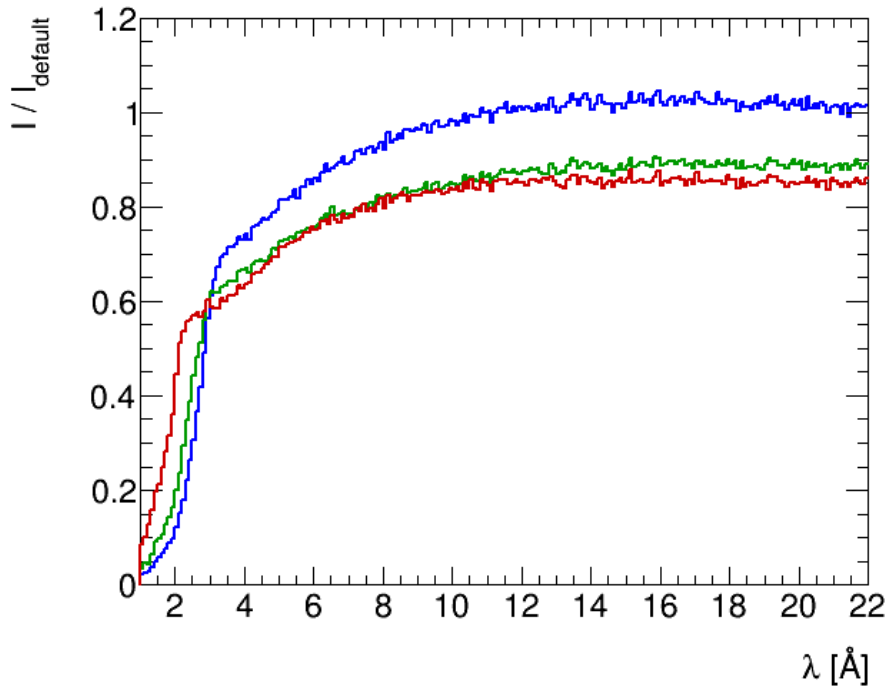


ToF spectrum:  
no frame overlap



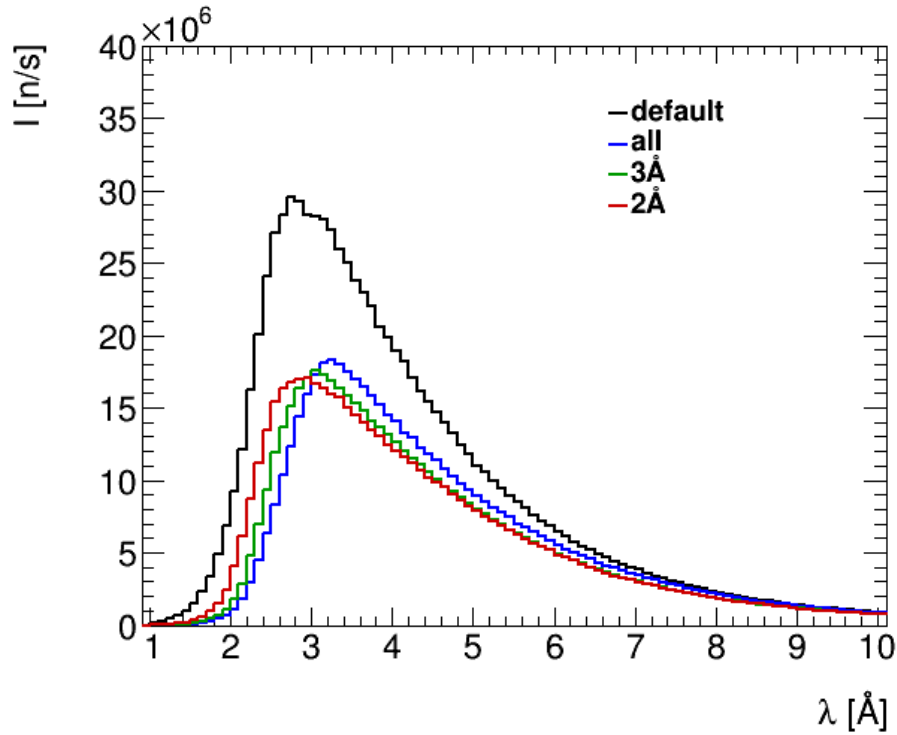
Extra slides

# Performance 2xLoS with 2m collimation

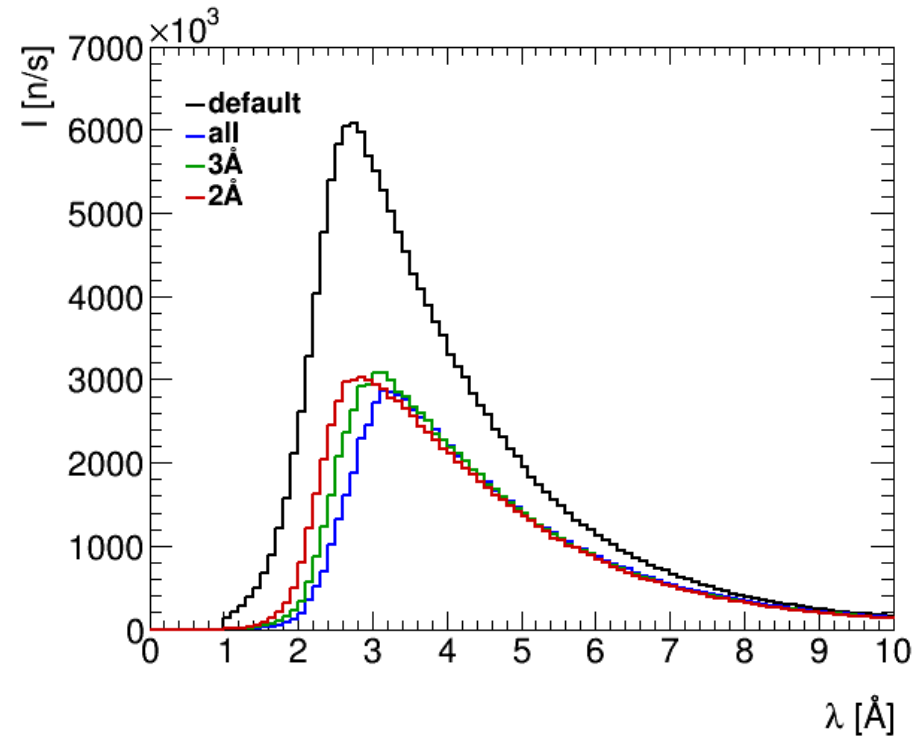


Propaganda version: no log x and longer wavelengths (left), larger binning (right)

# Wavelength spectrum

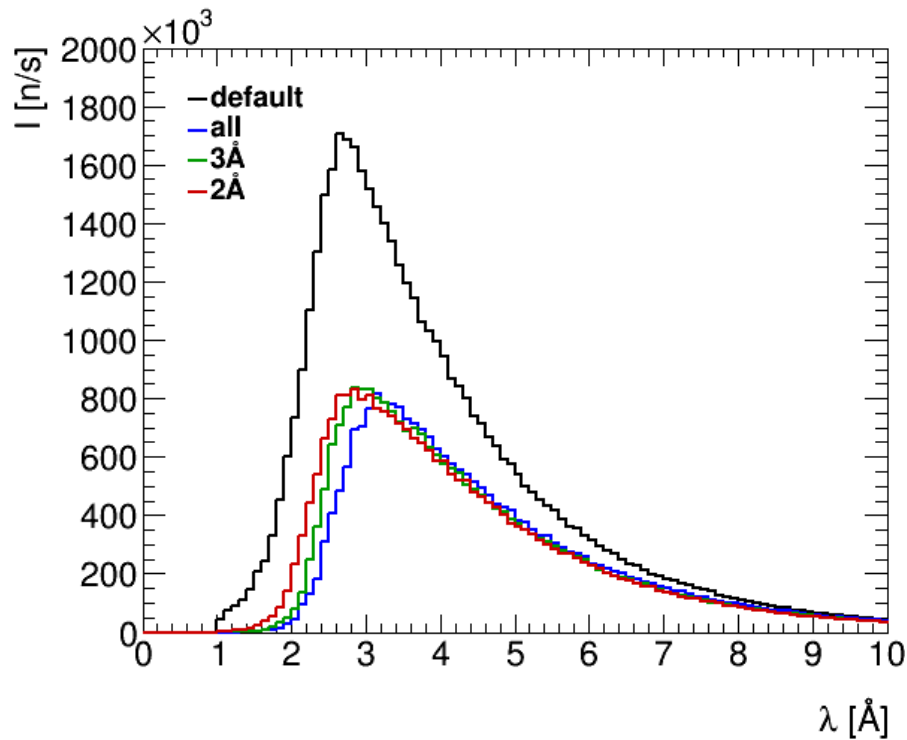


2m collimation



5m collimation

# Wavelength spectrum



10m collimation

	$I$ [n/s]	$F$ [n/scm <sup>2</sup> ]
<b>2 m collimation</b>		
default	$8.6 \cdot 10^8$	$1.1 \cdot 10^9$
option 1	$5.6 \cdot 10^8$	$7.2 \cdot 10^8$
option 2	$5.4 \cdot 10^8$	$6.8 \cdot 10^8$
option 3	$5.5 \cdot 10^8$	$7.0 \cdot 10^8$
<b>5 m collimation</b>		
default	$1.7 \cdot 10^8$	$2.1 \cdot 10^8$
option 1	$8.8 \cdot 10^7$	$1.1 \cdot 10^8$
option 2	$9.3 \cdot 10^7$	$1.2 \cdot 10^8$
option 3	$9.7 \cdot 10^7$	$1.2 \cdot 10^8$
<b>10 m collimation</b>		
default	$4.7 \cdot 10^7$	$5.9 \cdot 10^7$
option 1	$2.5 \cdot 10^7$	$3.1 \cdot 10^7$
option 2	$2.5 \cdot 10^7$	$3.2 \cdot 10^7$
option 3	$2.6 \cdot 10^7$	$3.3 \cdot 10^7$