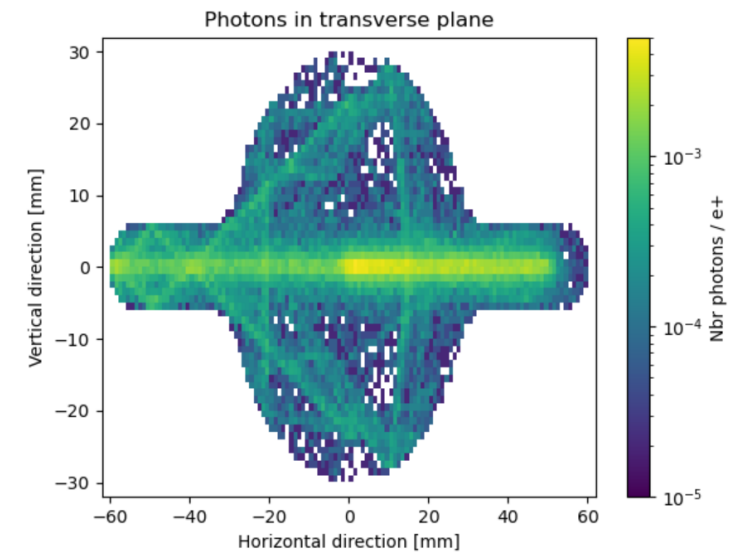


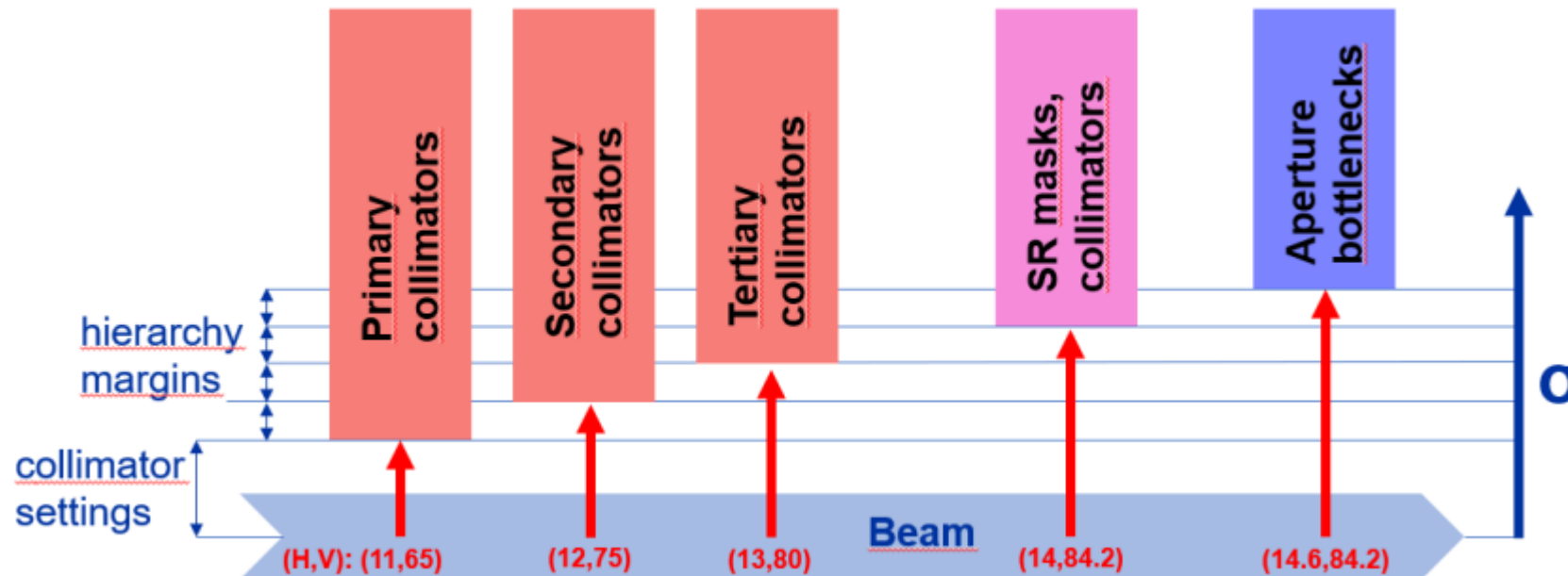
Updates on SR simulations of FCC-ee with BDSIM

K. André for the MDI study group
MDI meeting #60



Outline

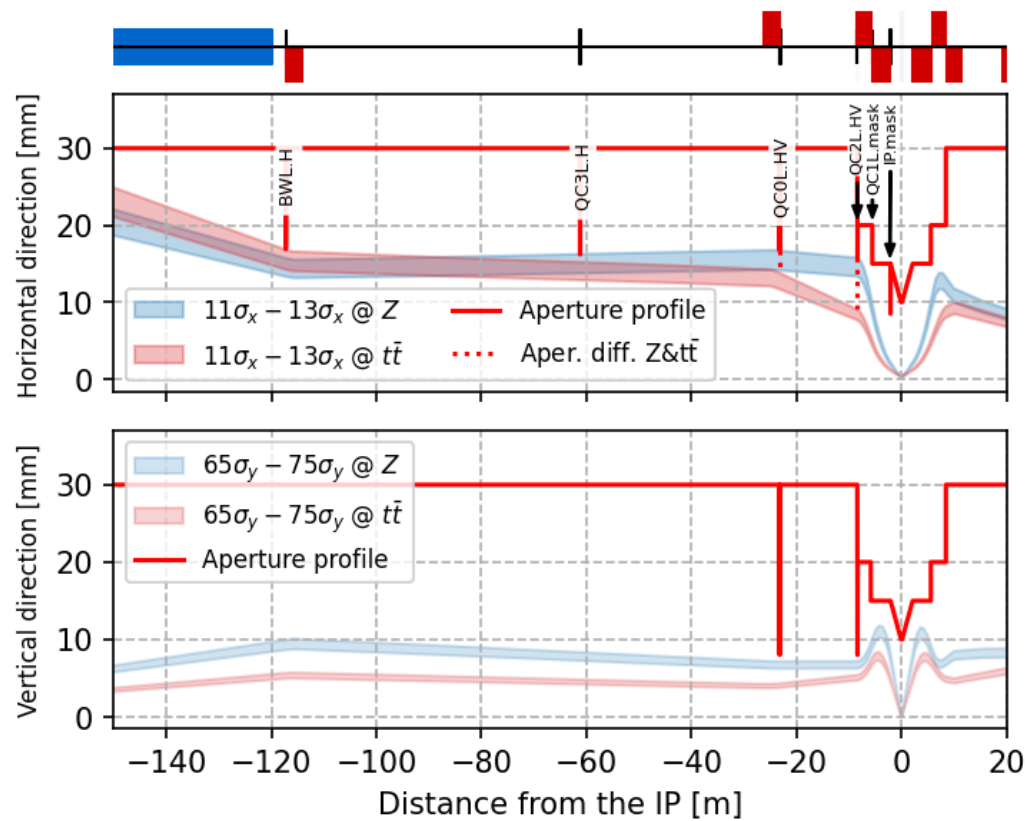
- SR collimators moved up to 14 sigmas instead of 13 sigmas to match the recent modifications of the collimation hierarchy from G. Broggi [\[link\]](#)



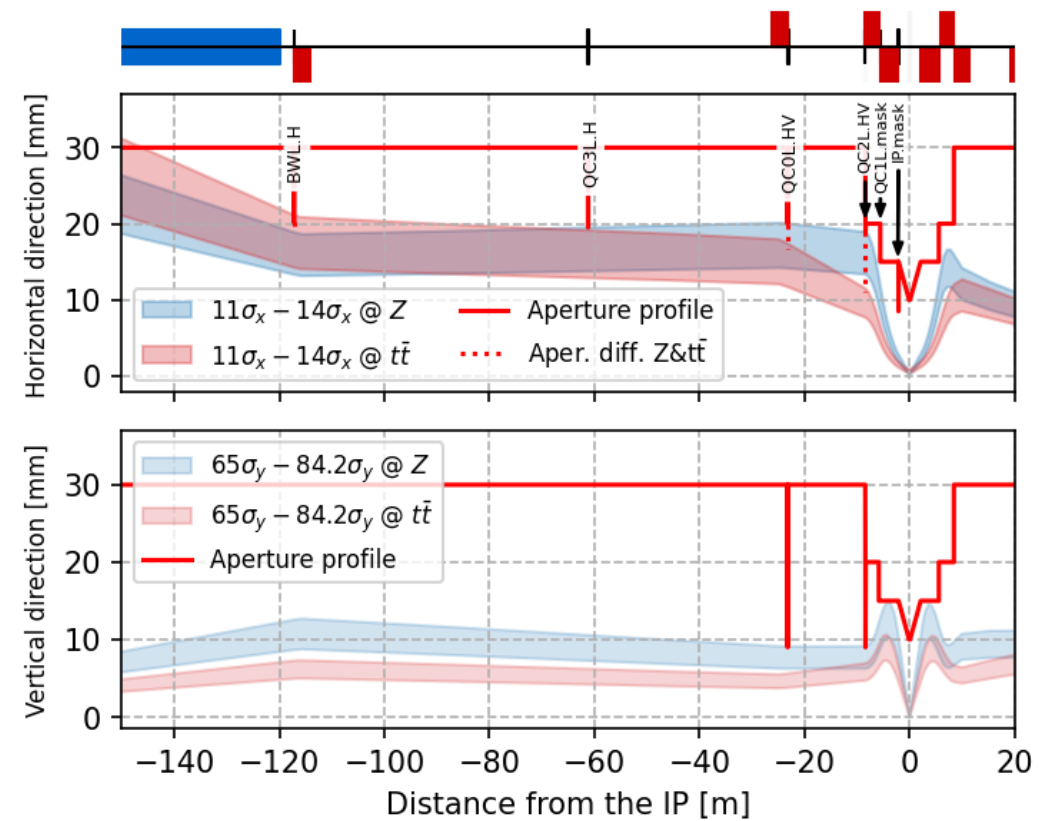
Outline

- SR update at the Z operation mode, featuring SR collimators at **14 sigmas** instead of 13 sigmas to match the recent modifications of the collimation hierarchy from G. Broggi [\[link\]](#)
 - Implementation of one tertiary collimator upstream the IP
 - Tertiary vertical collimator: 80 sigmas, at $s=-420\text{m}$ w.r.t. IP
 - Tertiary horizontal collimator: 13 sigmas, at $s=-690\text{m}$ w.r.t. IP (outside my model)
 - Implementation of a **new** SR collimator before BC1L 'polarimeter region', to mitigate the flux of SR photons reflected, combined with the tertiary vertical collimator upstream the IP as vertical SR collimator to mitigate SR photons vertically reflected.
- Objectif to evaluate the influence of these modifications.

SR collimators apertures to $14\sigma_x$, $84.2\sigma_y$, 10% beam size increase from beta-beating and 250 microns closed orbit uncertainty

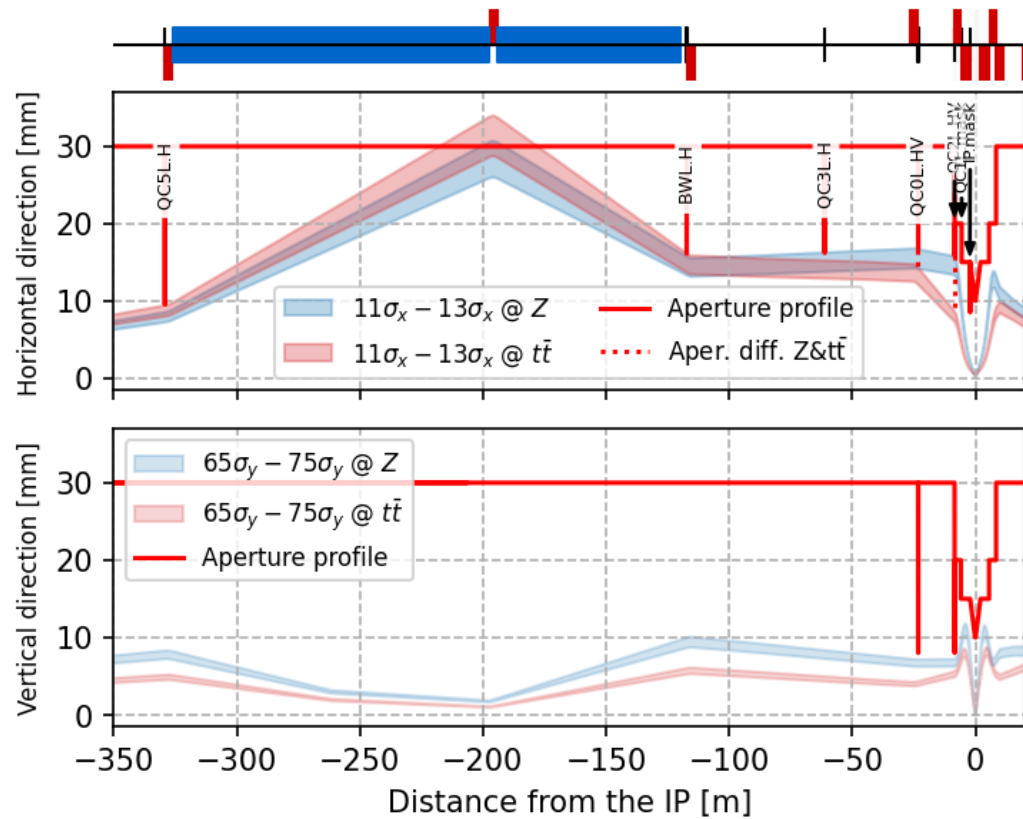


Nominal SR collimation

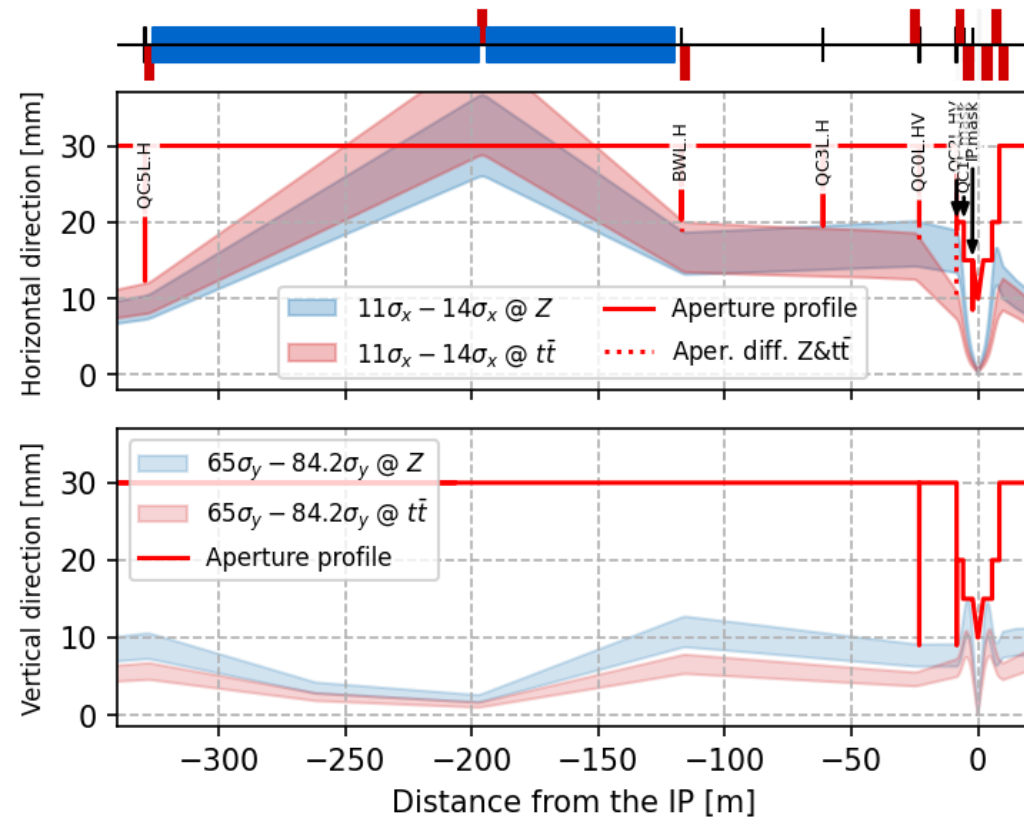


Updated SR collimation

Extended SR collimation scheme



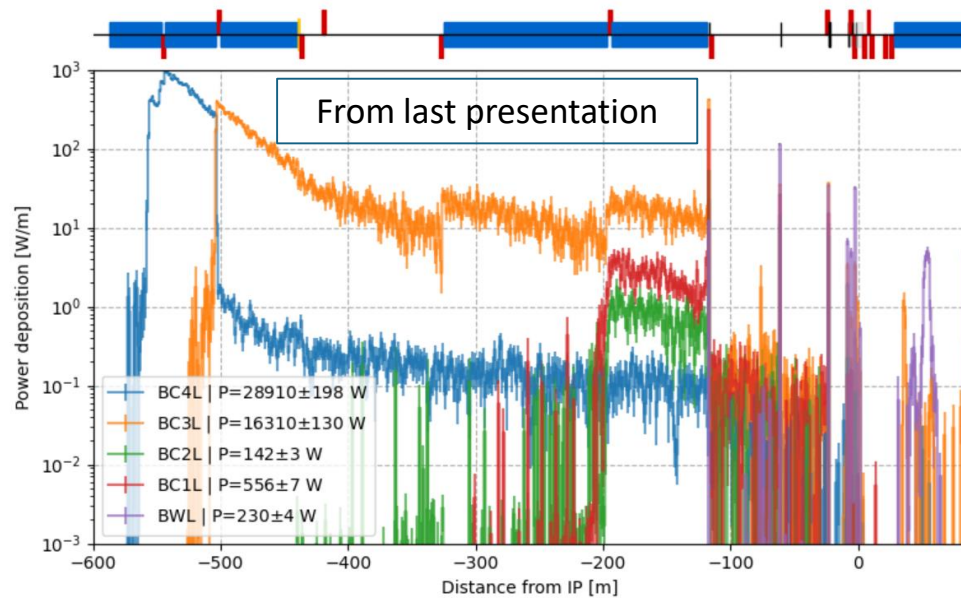
Extended SR collimation



Extended & updated SR collimation

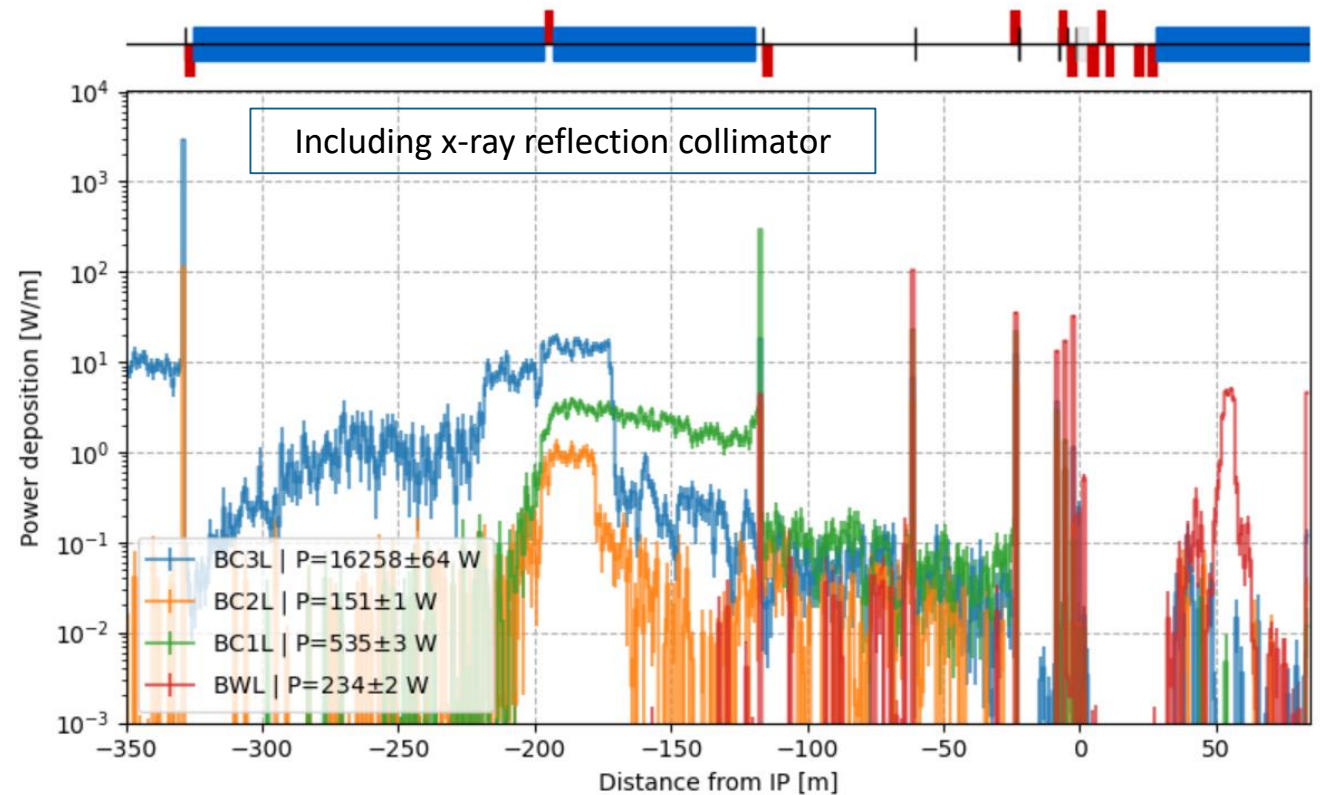
Name	Plane	Material	Length [cm]	Gap [σ]	Δ_{cut} [%]
TCP.H.B1	H	MoGr	25	11.0	8.9
TCP.V.B1	V	MoGr	25	65.0	-
TCS.H1.B1	H	Mo	30	13.0	6.7
TCS.V1.B1	V	Mo	30	75.0	-
TCS.H2.B1	H	Mo	30	13.0	90.6
TCS.V2.B1	V	Mo	30	75.0	-
TCP.HP.B1	H	MoGr	25	18.5	1.3
TCS.HP1.B1	H	Mo	30	21.5	2.1
TCS.HP2.B1	H	Mo	30	21.5	1.6
TCT.H.B1	H	MoGr	10	13.0	-
TCT.V.B1	V	MoGr	10	80.0	-
TCR.H.WL.B1	H	Inermet180	10	14.0	-
TCR.H.C3.B1	H	Inermet180	10	14.0	-
TCR.V.C0.B1	V	Inermet180	10	84.2	-
TCR.H.C0.B1	H	Inermet180	10	14.0	-
TCR.V.C2.B1	V	Inermet180	10	84.2	-
TCR.H.C2.B1	H	Inermet180	10	14.0	-

SR power deposition with wider aperture SR collimators

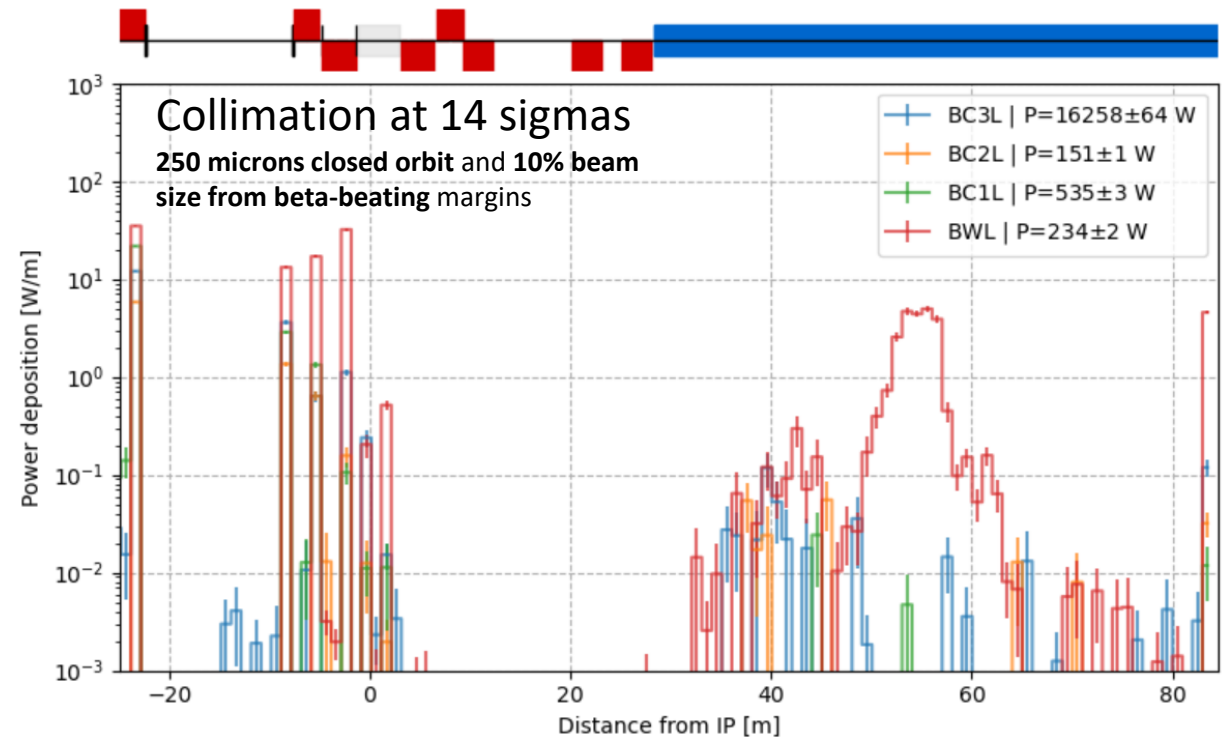
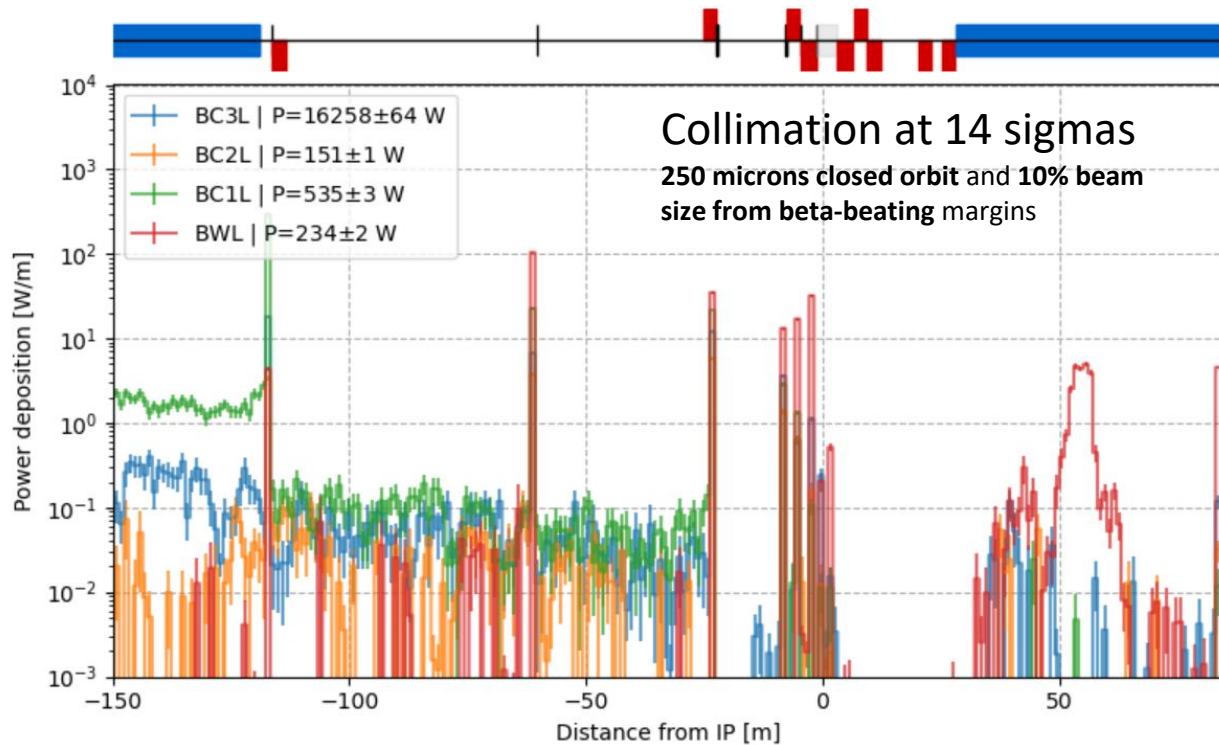


SR power in the first SR collimator
~3kW

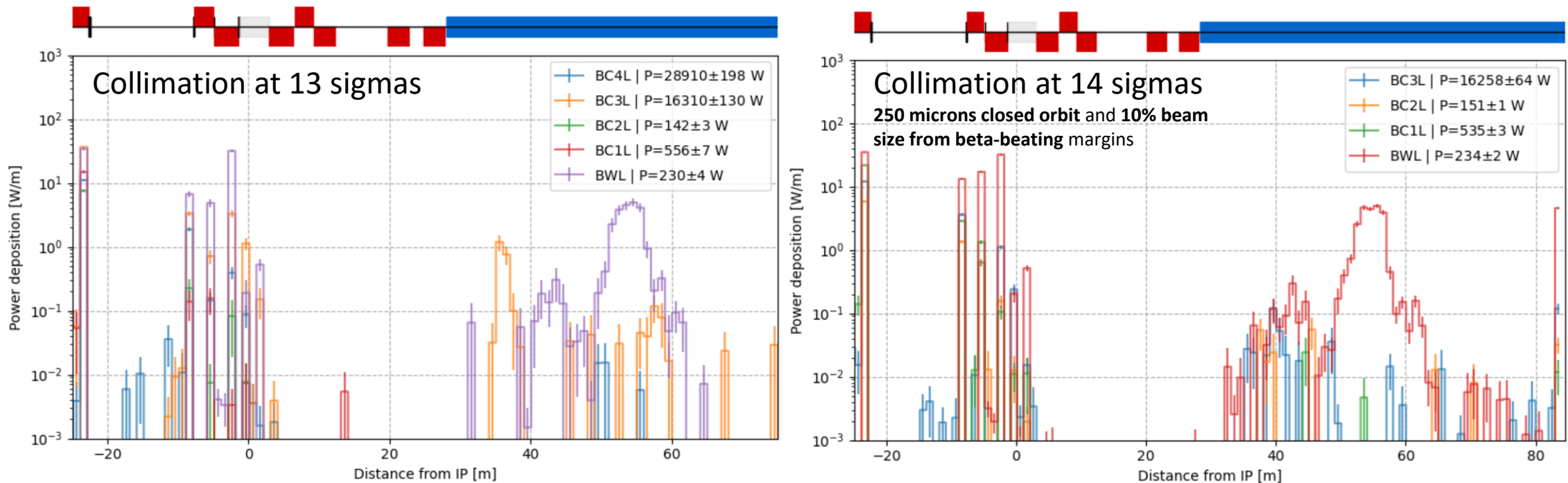
Reduced power deposition
downstream, does it help at the IP ?



SR power deposition with wider aperture SR collimators



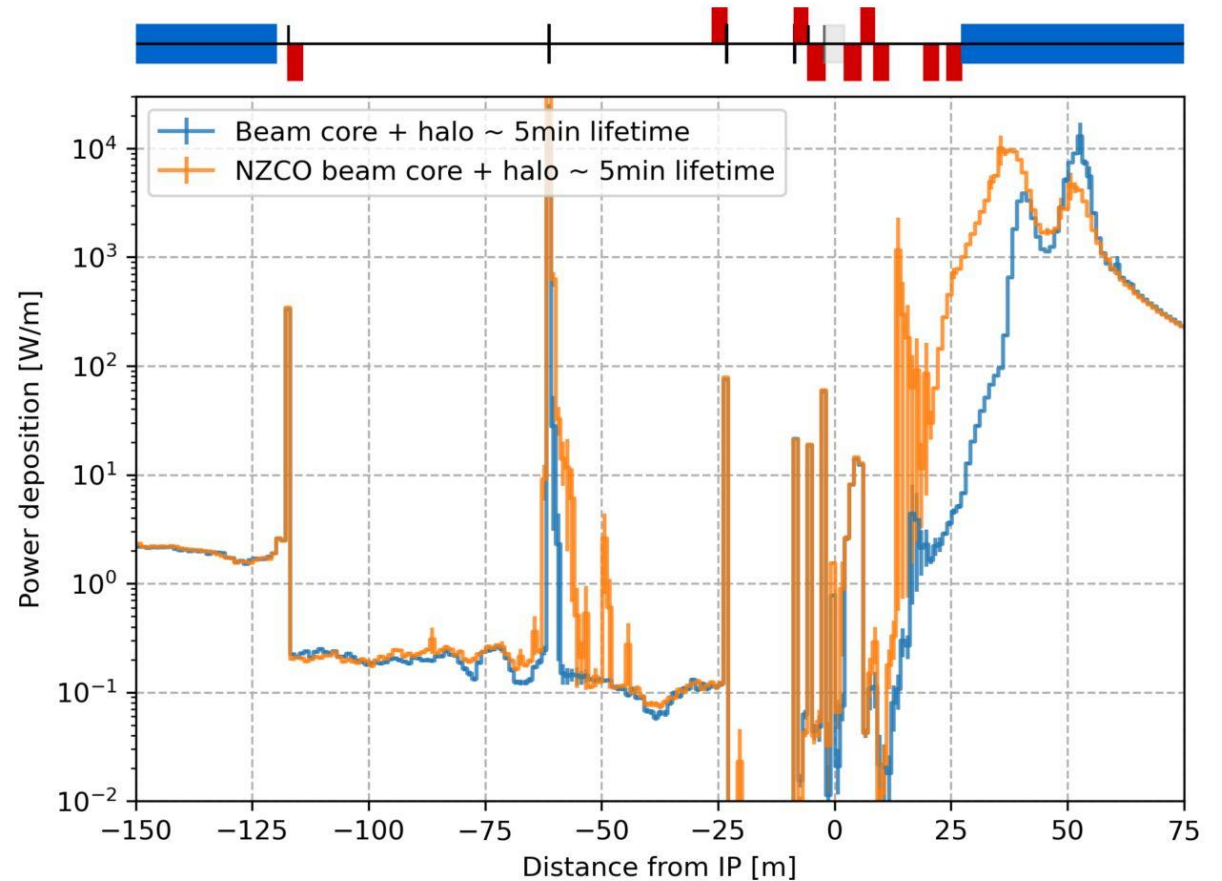
Comparison close to the IP



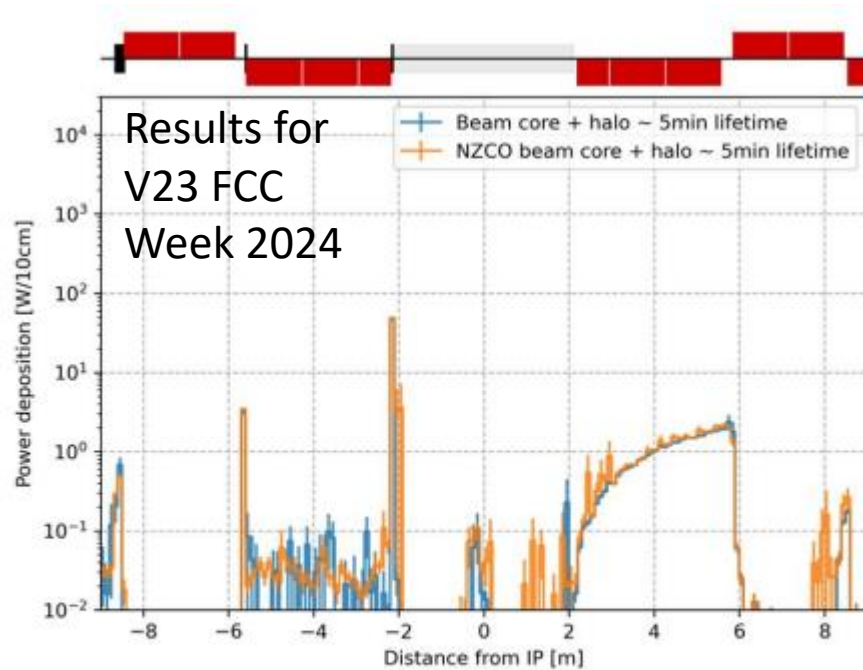
- **Similar power deposition** in the collimators and masks,
- **SR power deposition in the central chamber from BC3L** decreases although all SR collimators are more opened. X-ray reflection reduced by the first horizontal collimator.

Total SR power deposition near the IP

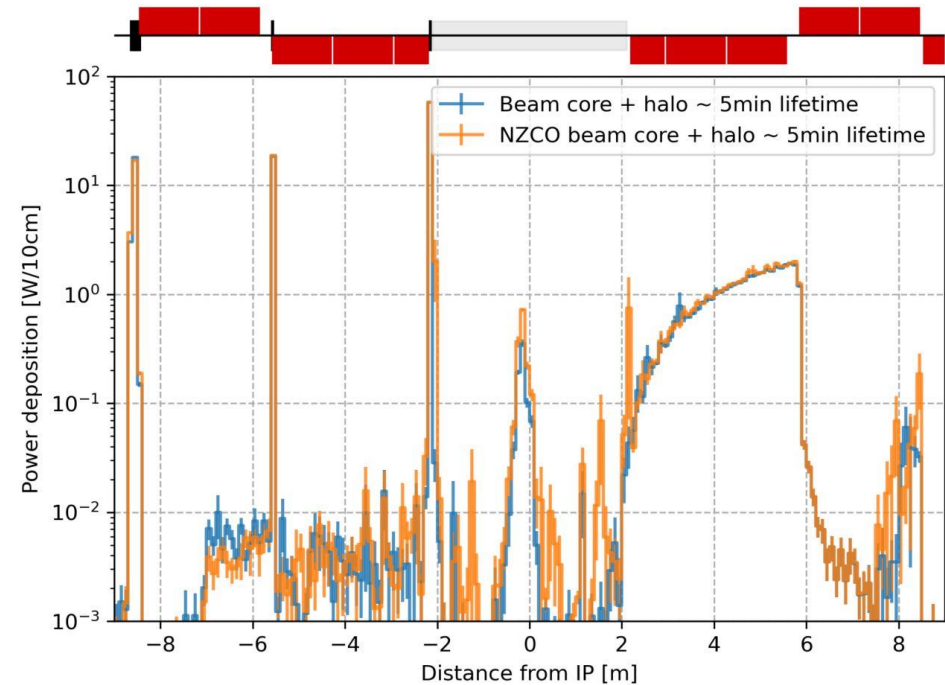
- Very large power deposition in one SR collimator, to be investigated further
 - Primary particle lost although it is opened at 14 sigmas + some margins
 - May create a shower downstream.



Total SR power deposition near the IP



GHC - SR power deposition summary
1% of the particles in the tails, with beam lifetime equivalent to 5 min, and 100 μm X&Y and 6 μrad PX&PY applied to the NZCO beam core.



The SR power deposition in the region -9/+9m around the IP remains similar to the previous results (V23, FCC week 2024) although the SR collimators have been further opened.

Slightly more photons hitting the central chamber.