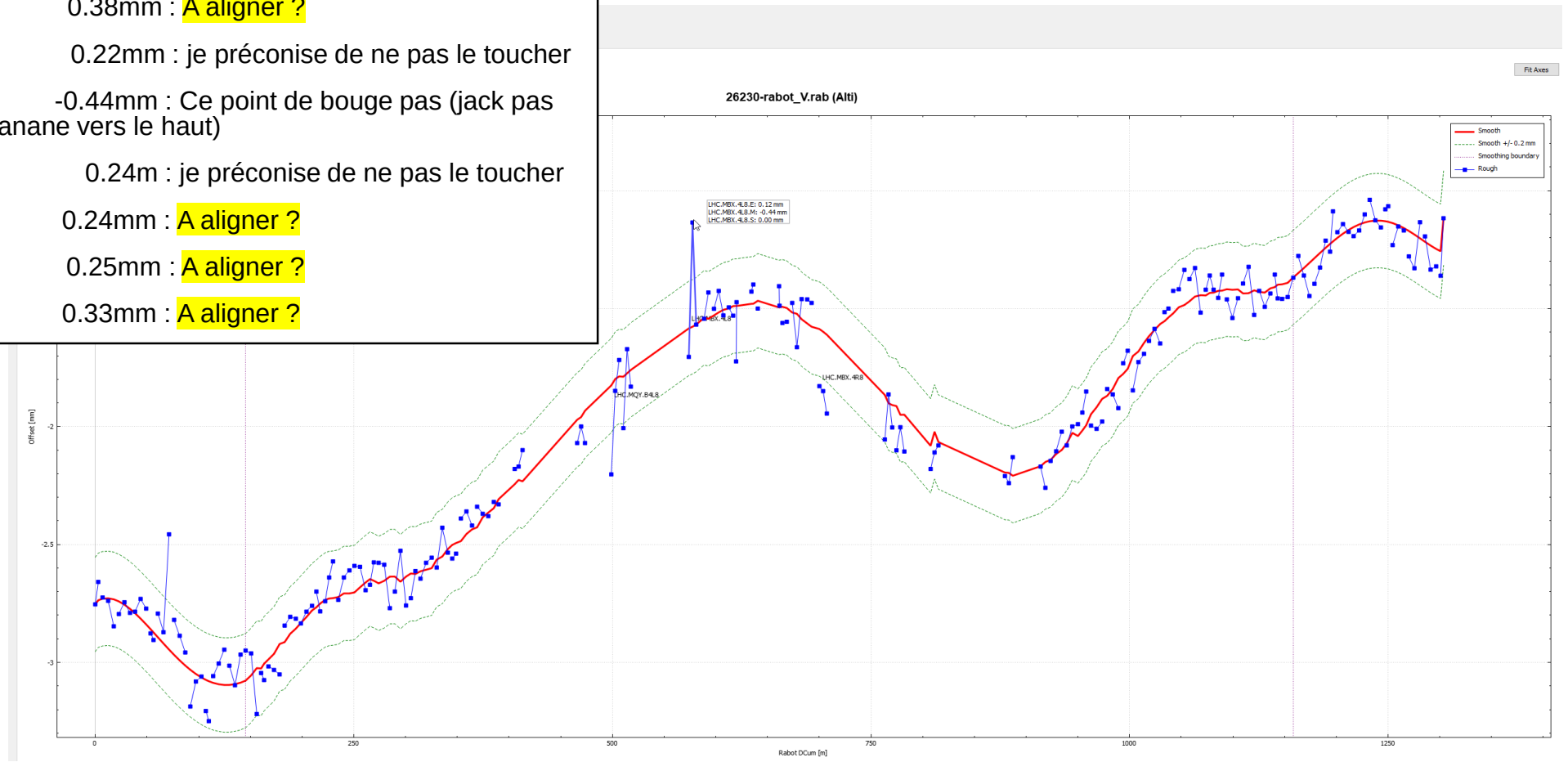
Aperture checks in Point 8

R. De Maria

Misalignment report

- LHC.MB.C14L8.S -0.49mm : lissage en cours dans le secteur 78
- LHC.MQY.B4L8.E 0.38mm : A aligner ?
- LHC.MBRC.4L8.E 0.22mm : je préconise de ne pas le toucher
- LHC.MBX.4L8.M -0.44mm : Ce point de bouge pas (jack pas au contact, aimant en banane vers le haut)
- LHC.MBXWS.1L8.E 0.24m : je préconise de ne pas le toucher
- LHC.MBX.4R8.E 0.24mm : A aligner ?
- LHC.MBX.4R8.M 0.25mm : A aligner ?
- LHC.MBX.4R8.S 0.33mm : A aligner ?



HL-LHC Protected Apertures

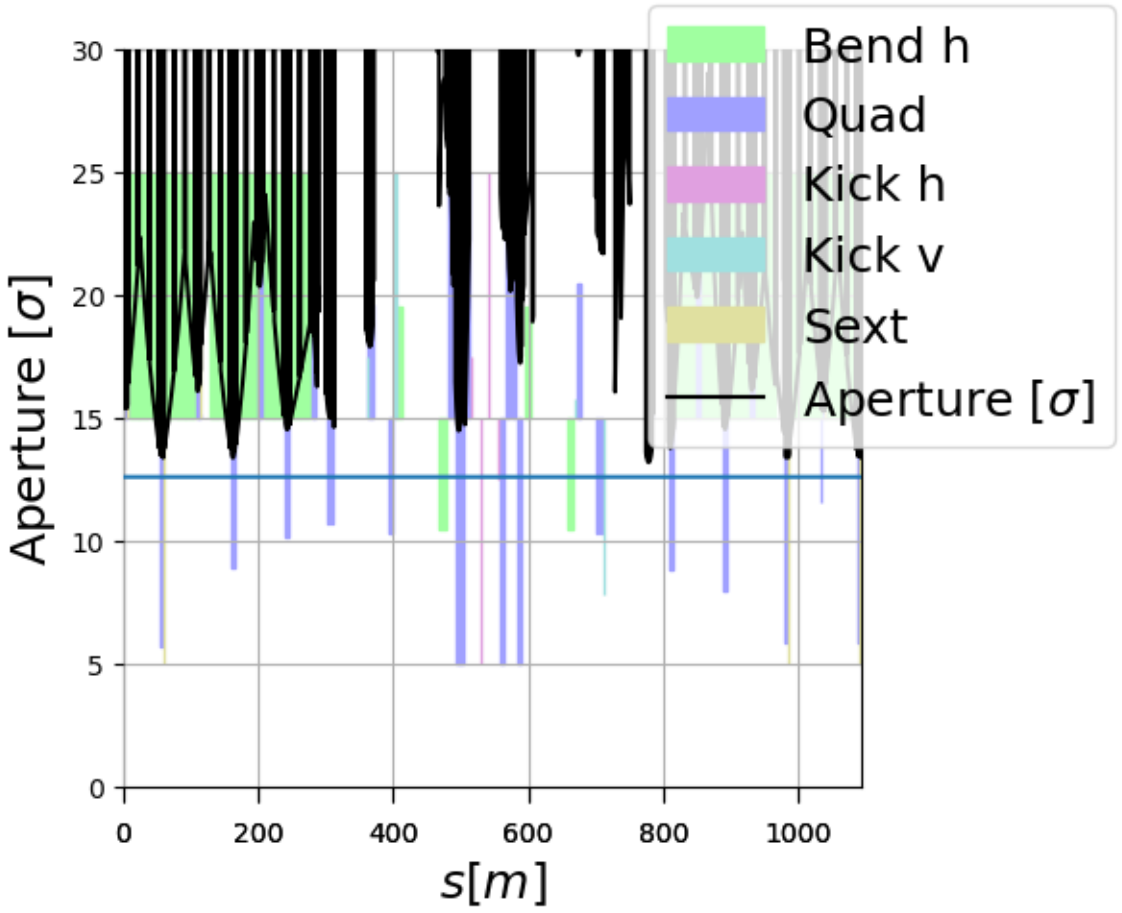
Parameters	7 TeV	0.45 TeV
Emittance normalized	2.5µm	
Radial CO [mm]	2	
Mom offset	$2\ 10^{-4}$	$8.6\ 10^{-4}$
Dispersion	0.1	0.14
Beam size	1.1	1.05
Min Ap. no TCT [σ]	19.4*	12.6
Min H. Ap. with TCT [σ]	table	12.6
Min V. Ap. with TCT [σ]	11.2	12.6

$\Delta\mu_x$ MKD-TCT [°]	H. Ap. W [σ@2.5µm]	H. Ap. CuCD [σ@2.5µm]
0-20	11.2	11.2
30	11.9	11.2
40	12.9	11.9
50	13.8	12.8
60	14.5	13.6
70	14.6	14
80-90	14.6	14.3

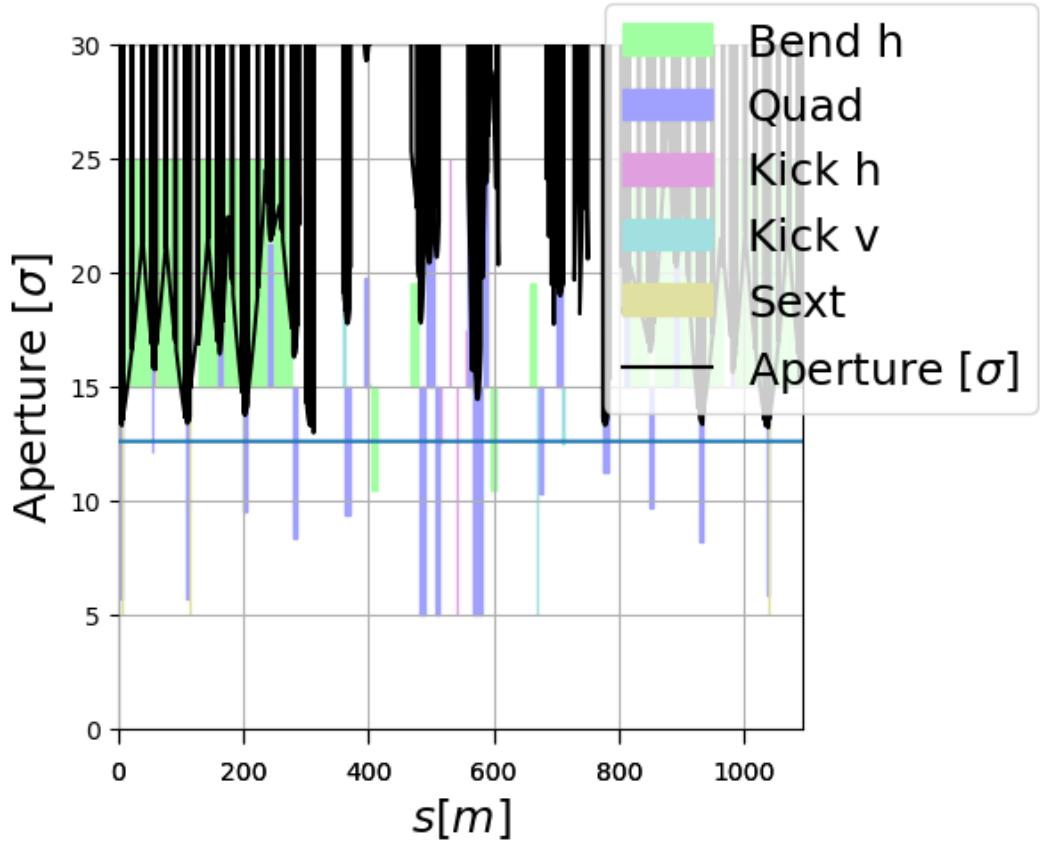
R. Bruce et al. CERN-ACC-2017-0051 and proposal of differentiating H/V collimators (R. Bruce).

Injection aperture injection

Beam 1

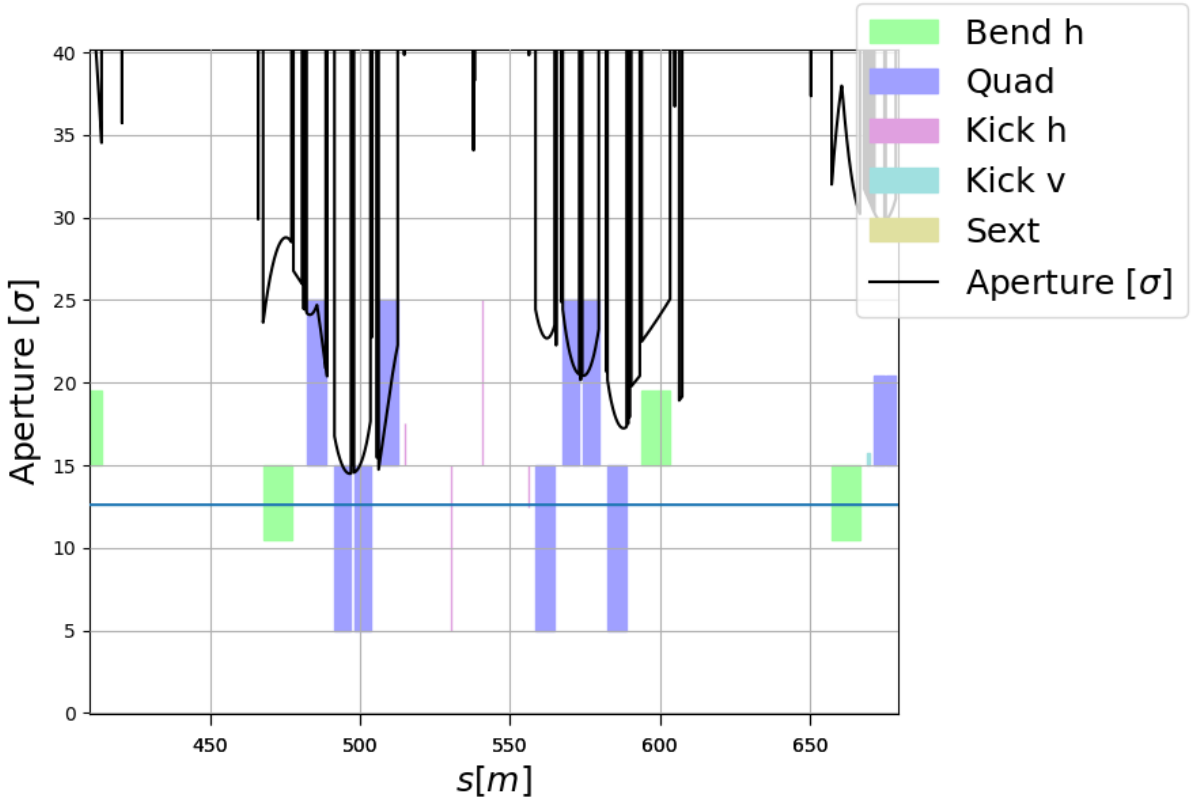


Beam 2



Injection aperture injection (detail)

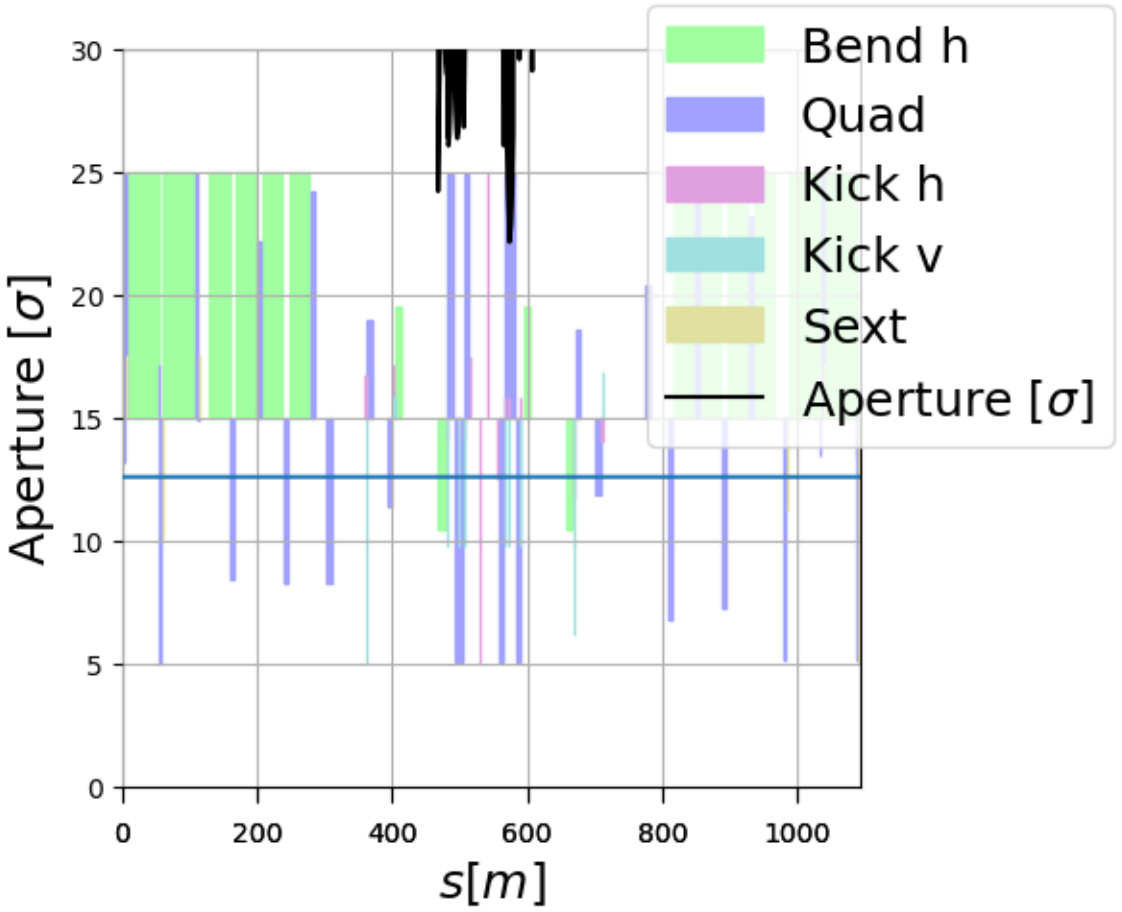
Beam 1



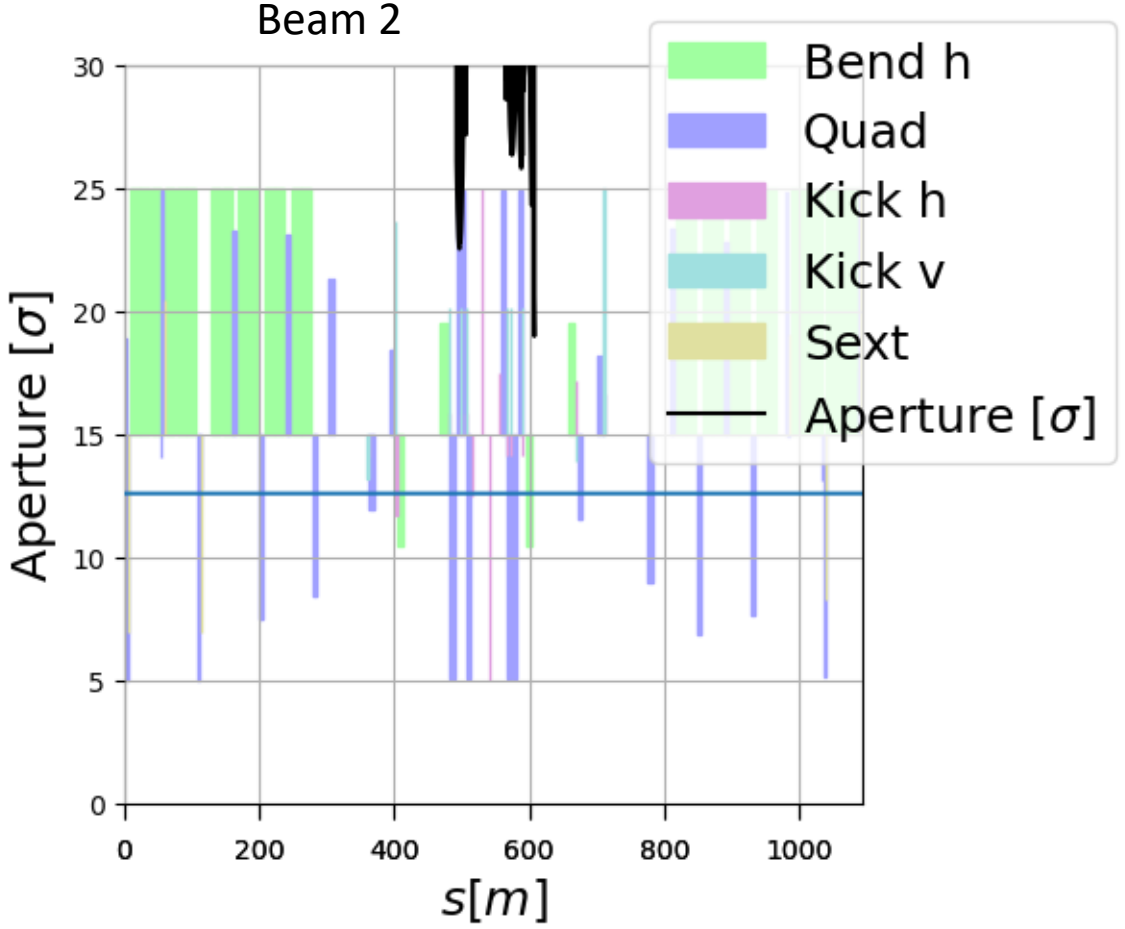
Aperture restriction dominated by H gap.

2m protons H crossing

Beam 1

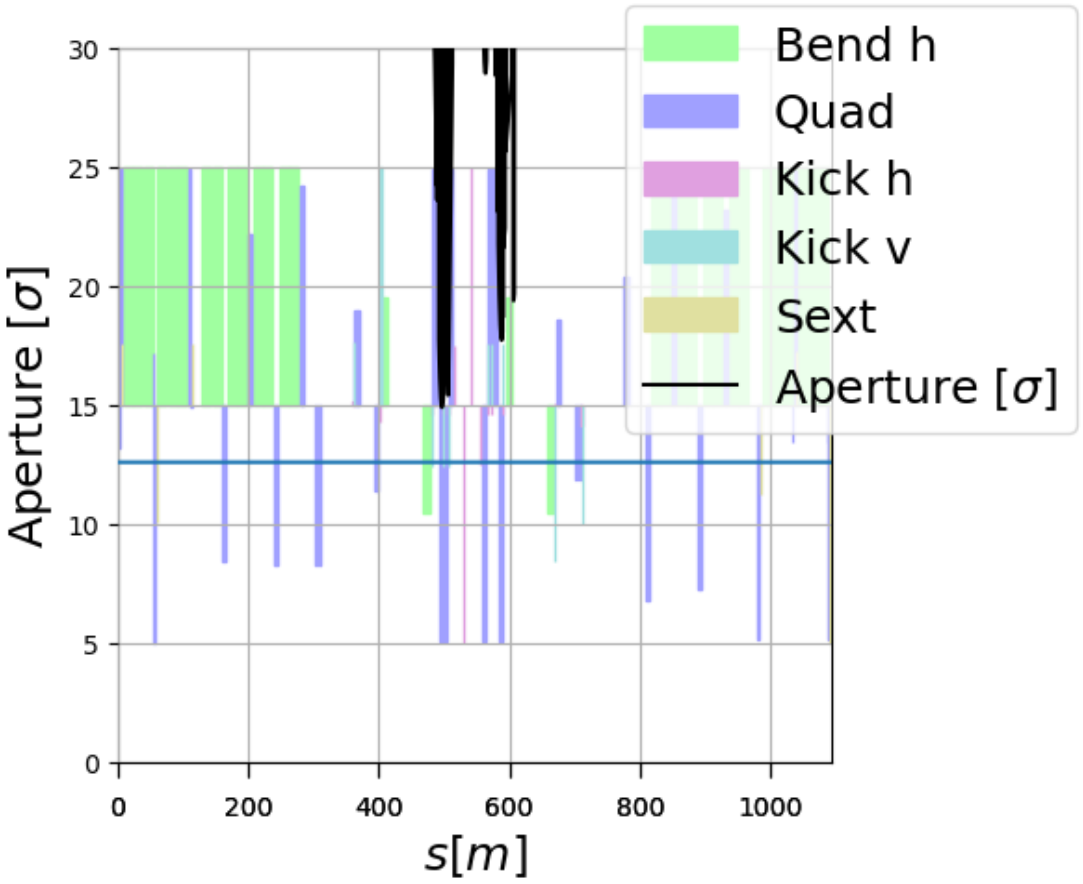


Beam 2

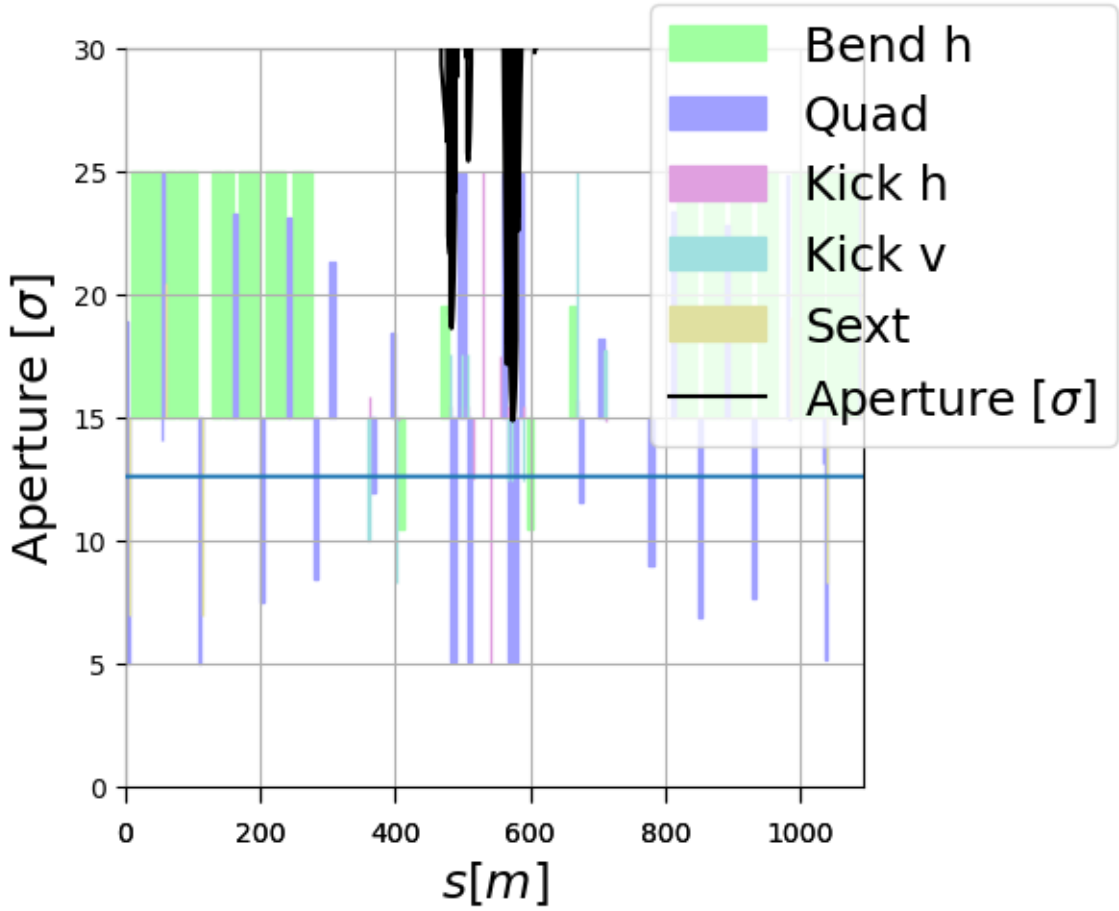


2m proton V crossing (-200 murad)

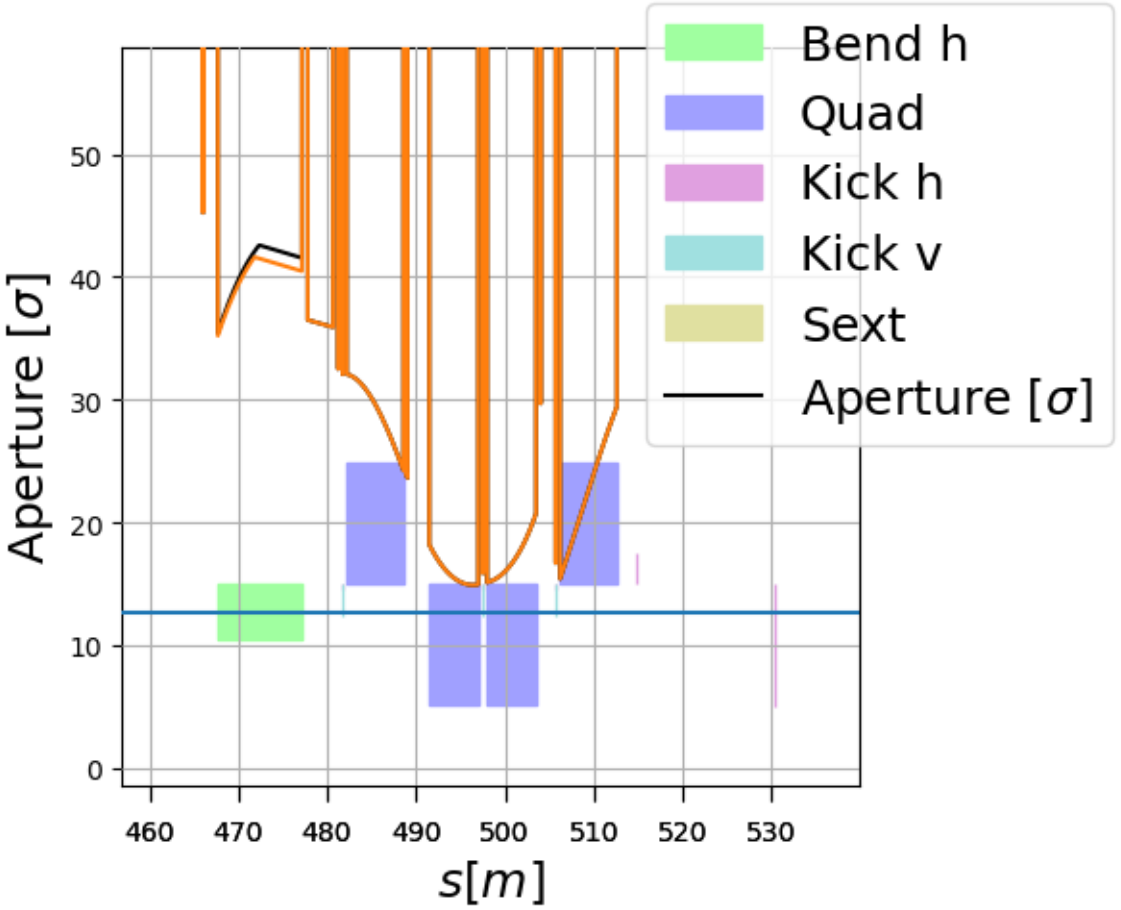
Beam 1



Beam 2



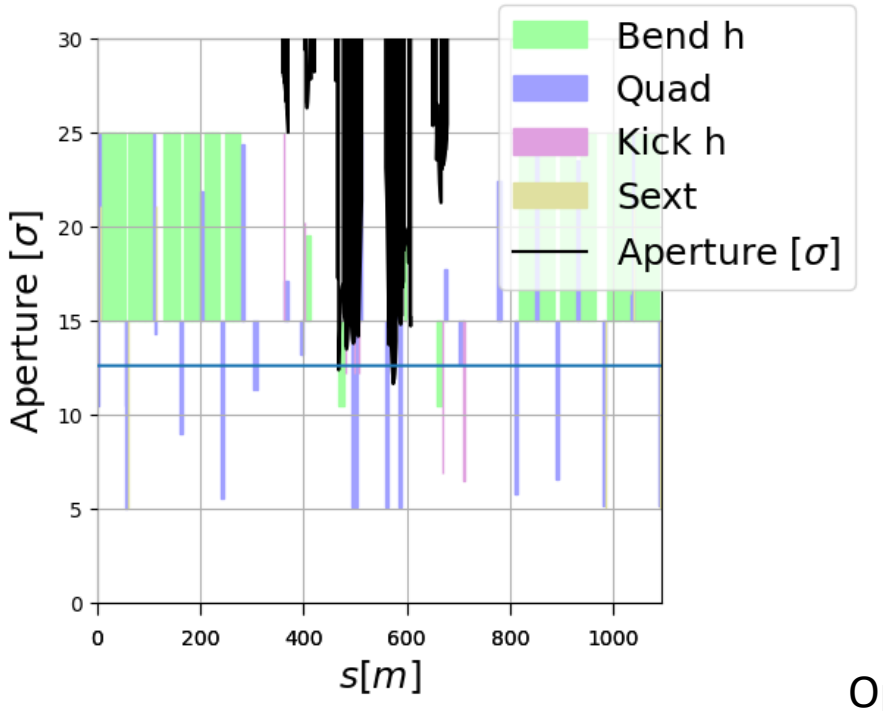
2m proton V crossing (-200 murad) detail



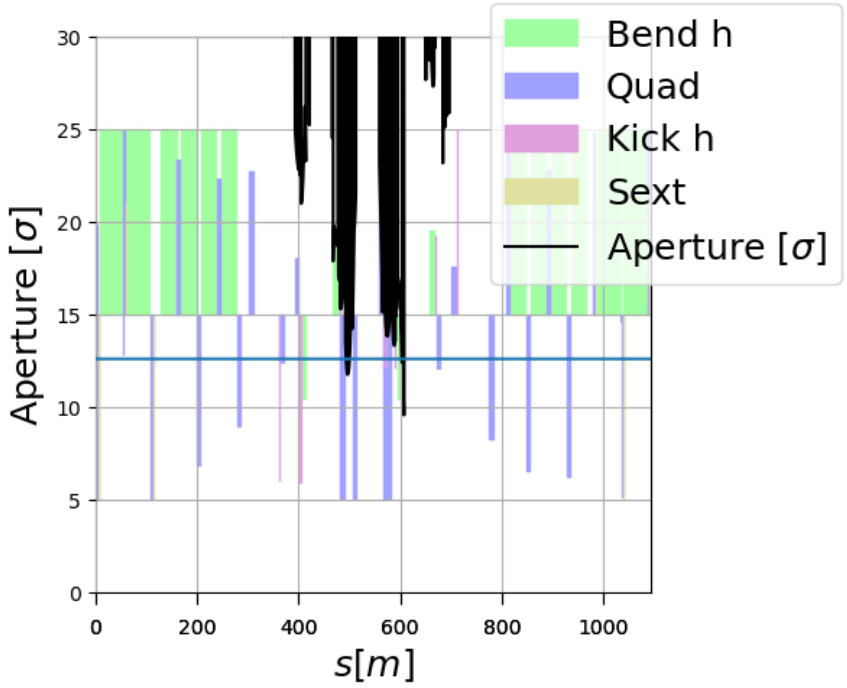
Impact of 0.5 misalignment small.

0.5m (tentative) for ions for H crossing (170 murad)

Beam 1



Beam 2



Optics parameters are tentative (realistic beta* around 0.7m for the TCDDM in Beam 2).
MBX still in the shadow of the triplet, bottleneck in the H plane.