

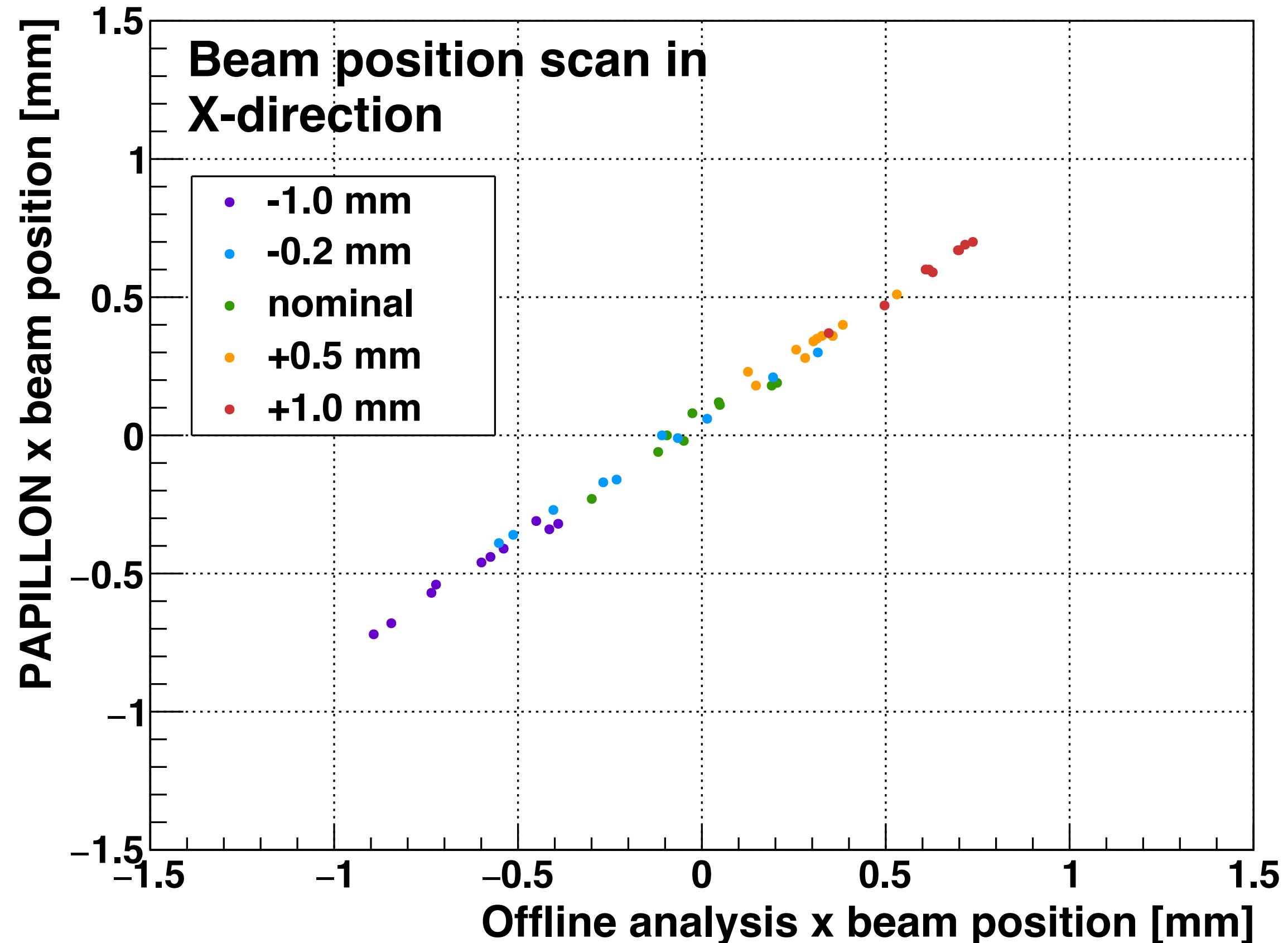


PAPILLON

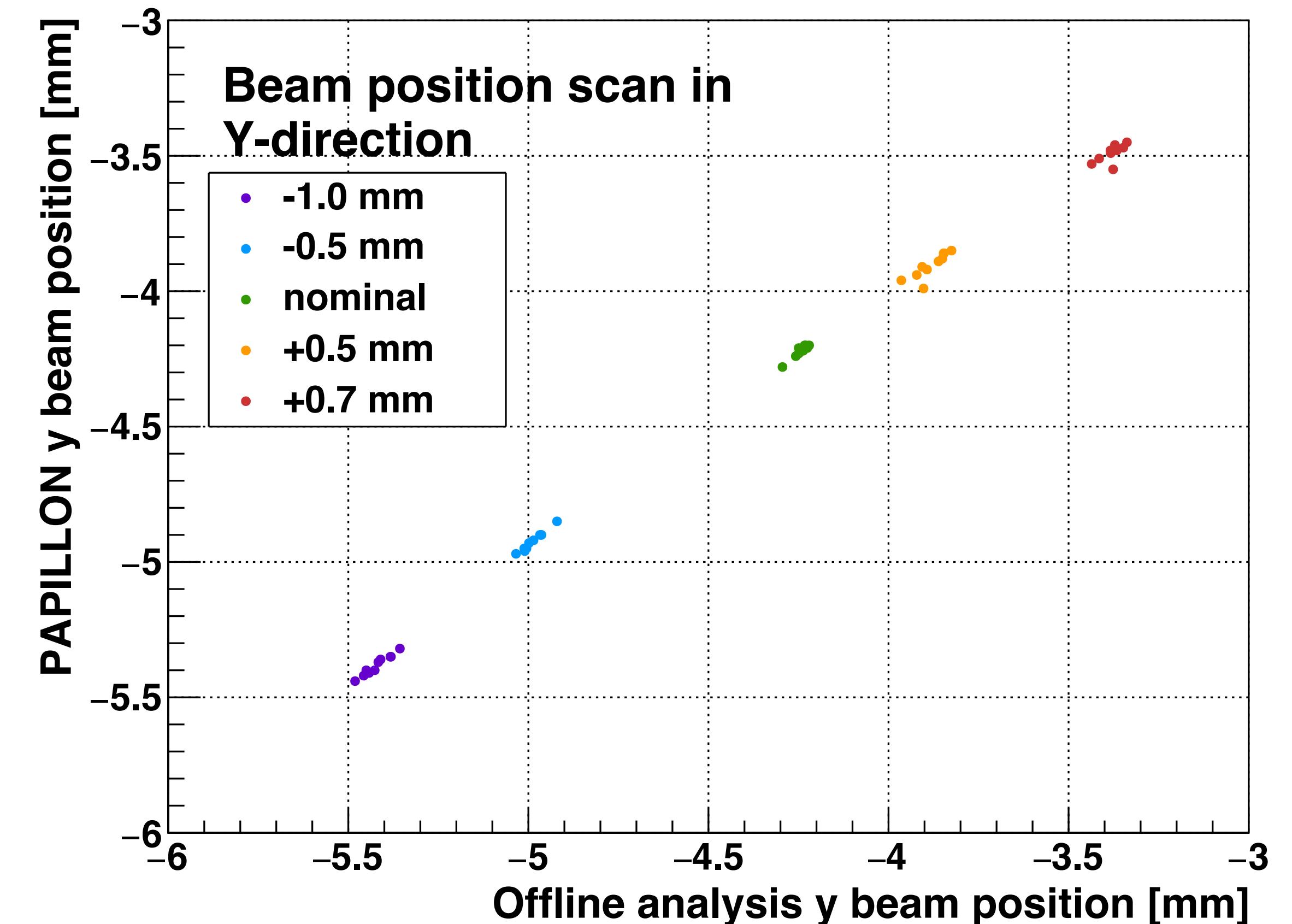
Beam Position&Width Scan Test

Seidai Tairafune
(Tohoku University)
Dec. 25, 2023

Beam Position Scan

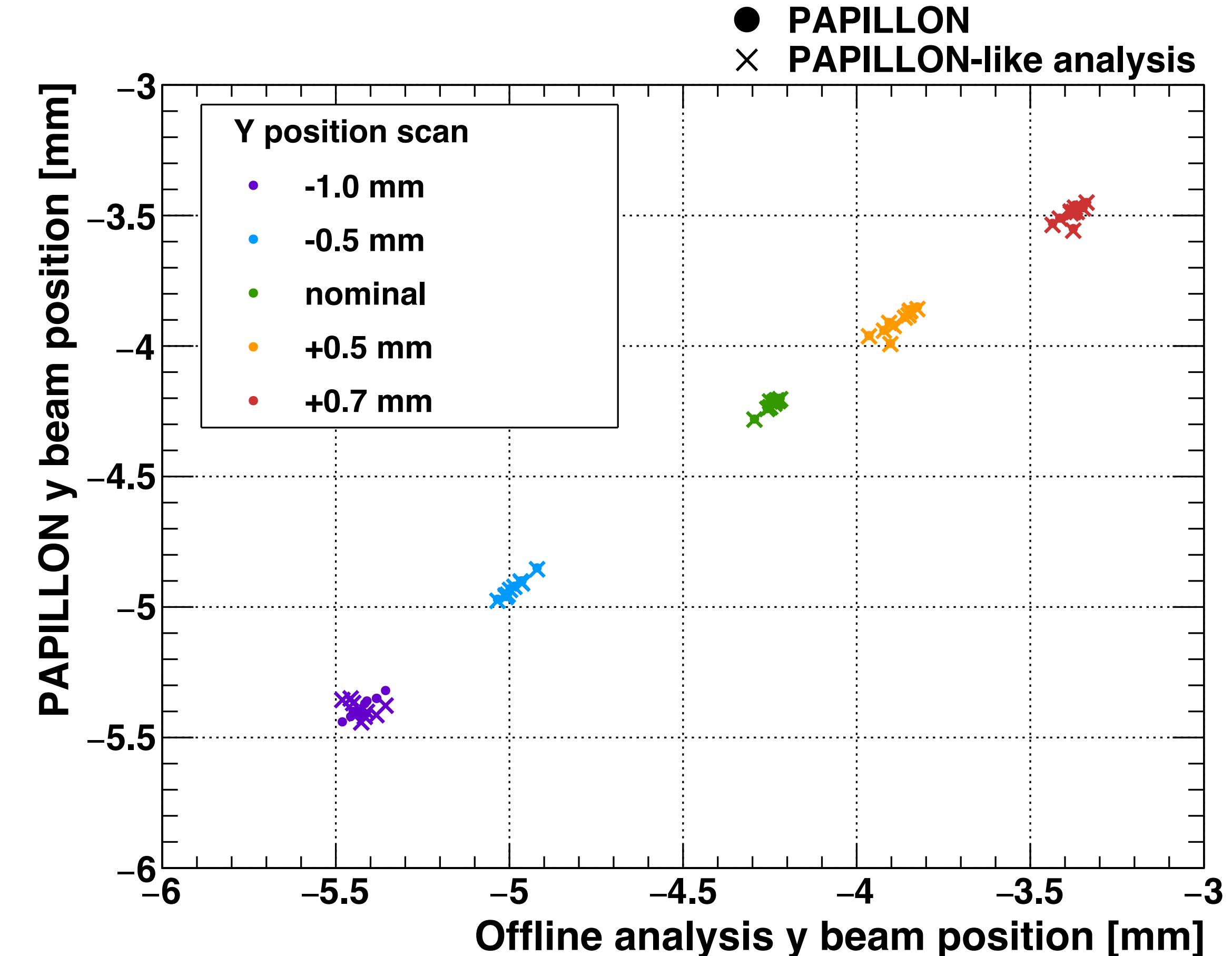
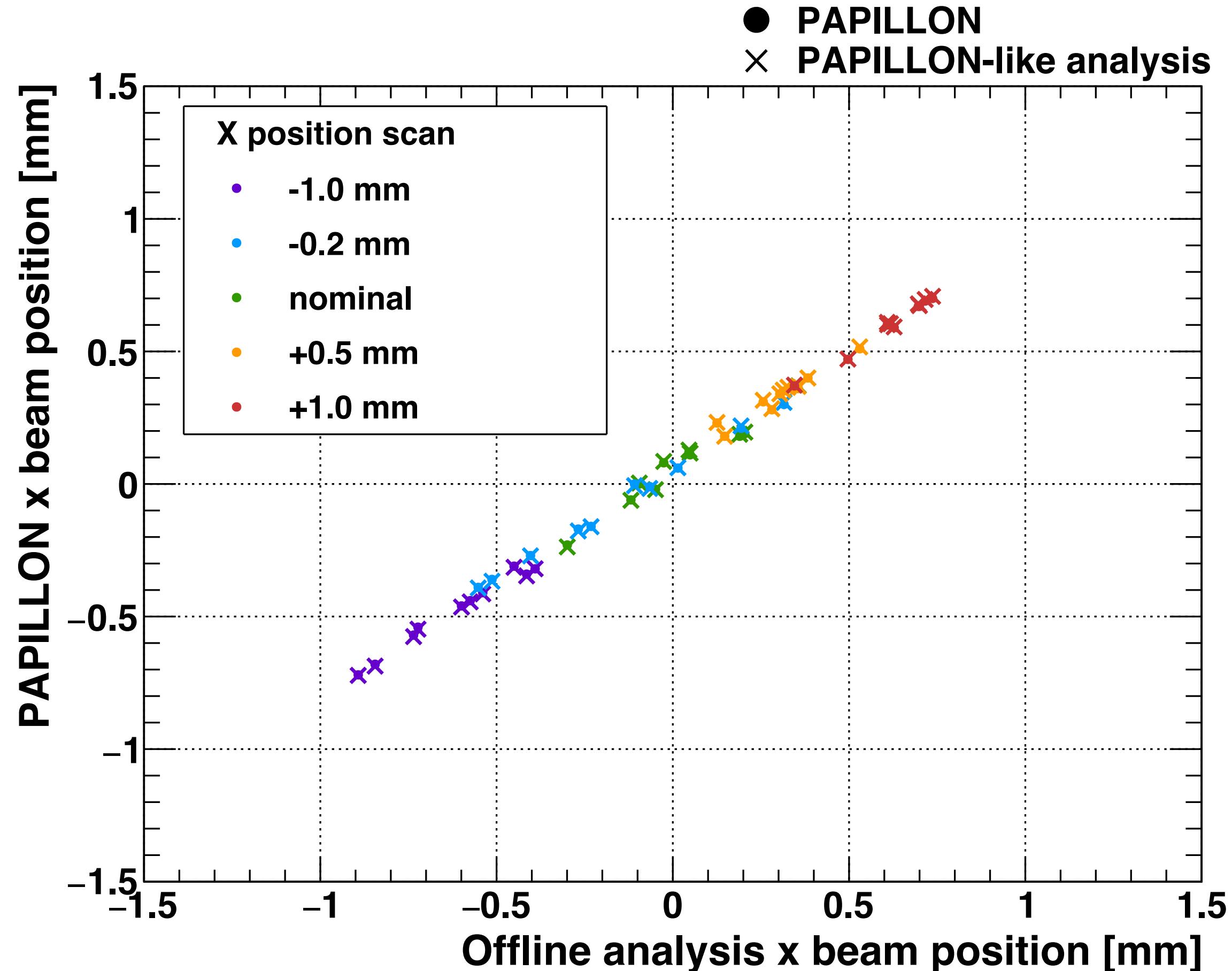


Correlation factor: 0.9995



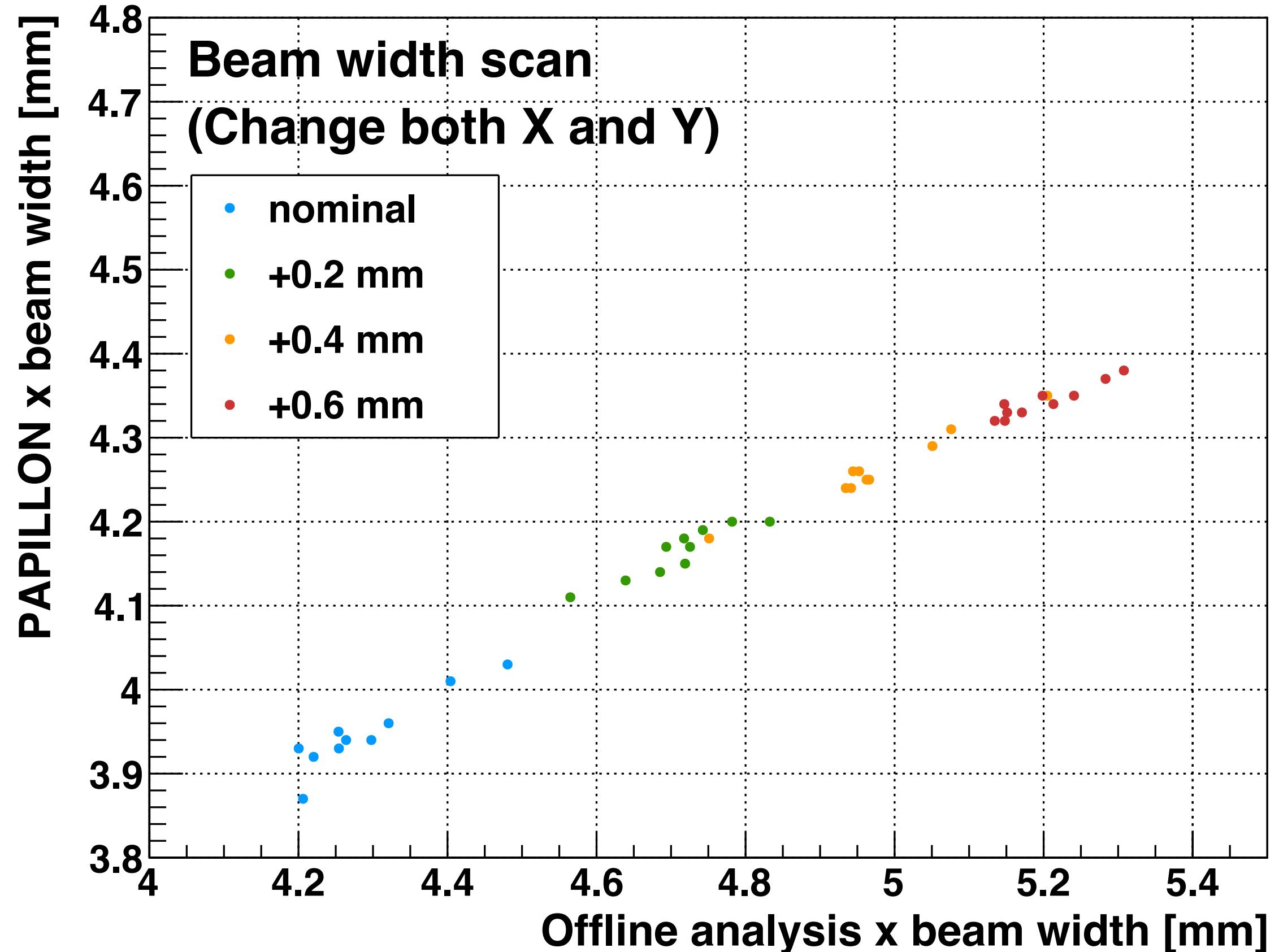
Correlation factor: 0.9999

Comparison with Software Expectations (Position)

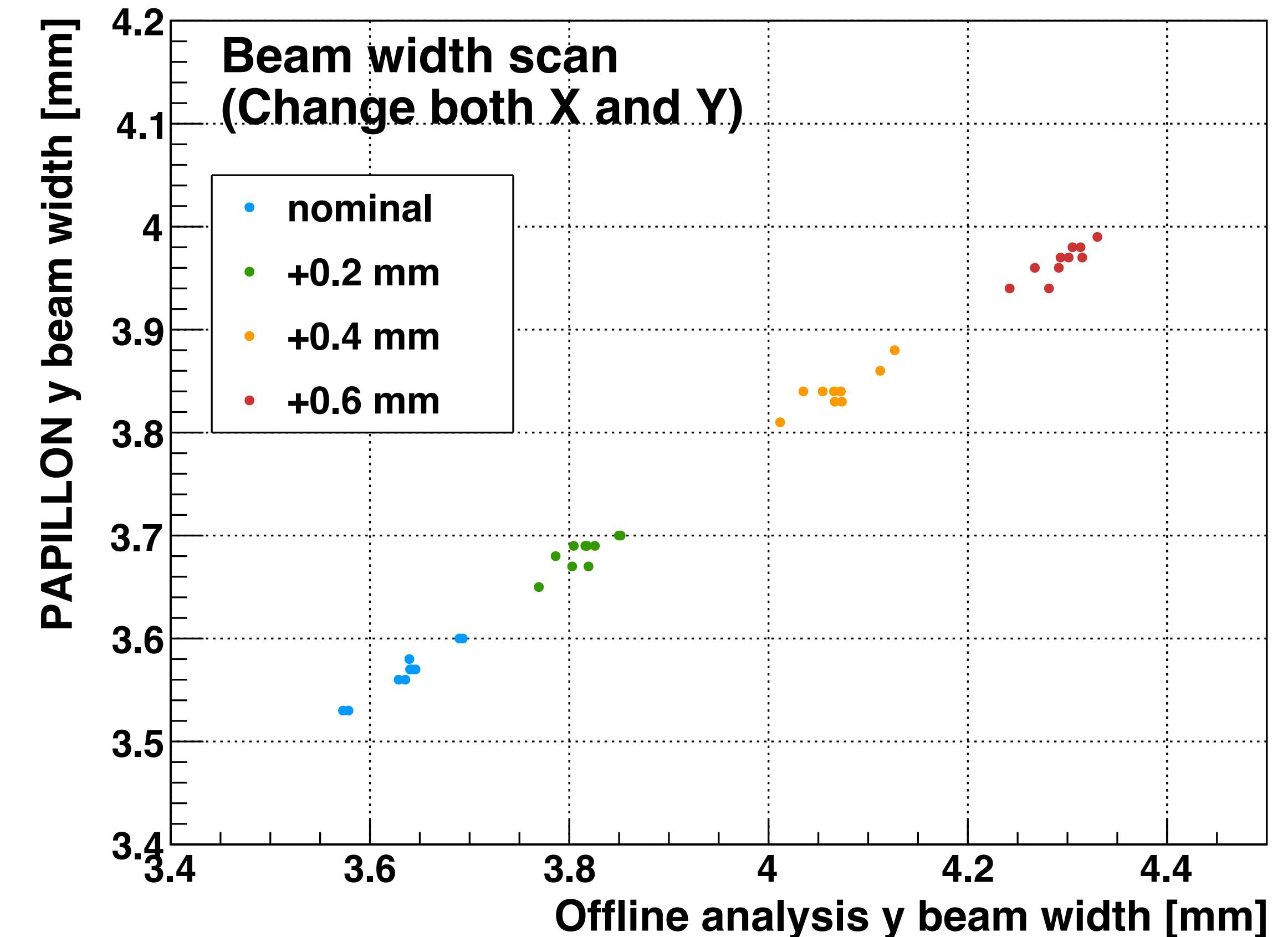


PAPILLON-like analysis used waveform of PAPILLON.

Beam Width Scan

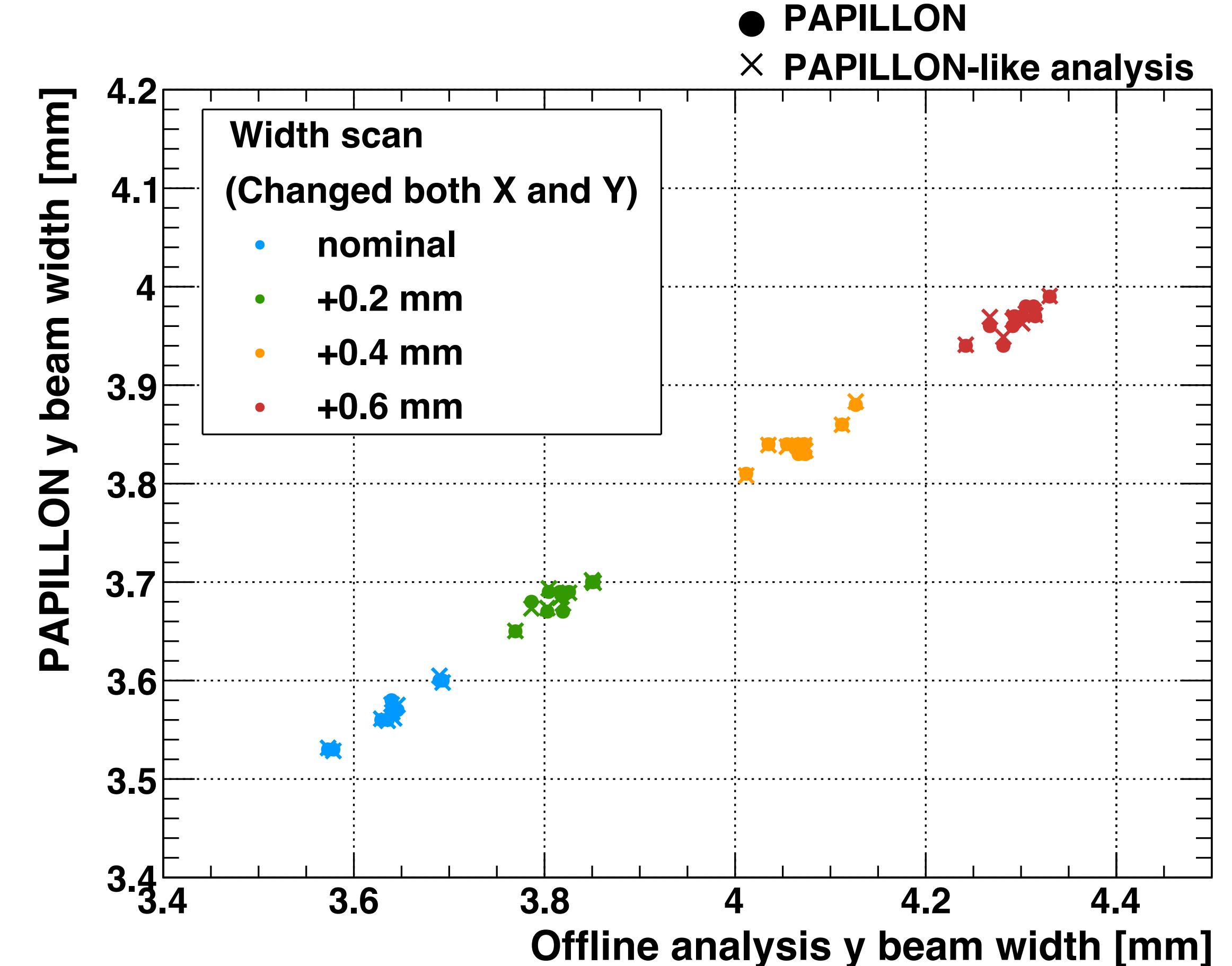
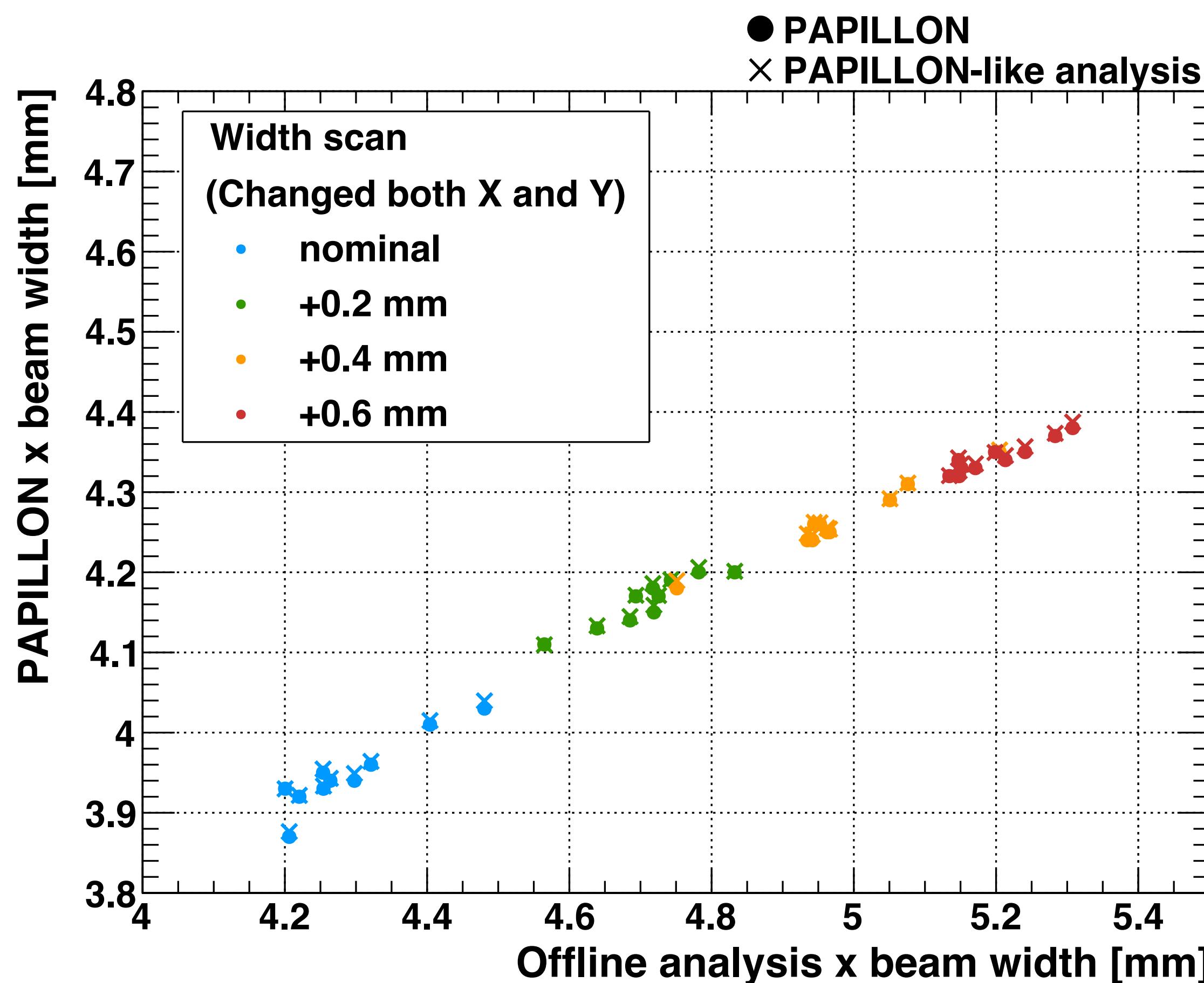


Correlation factor: 0.993



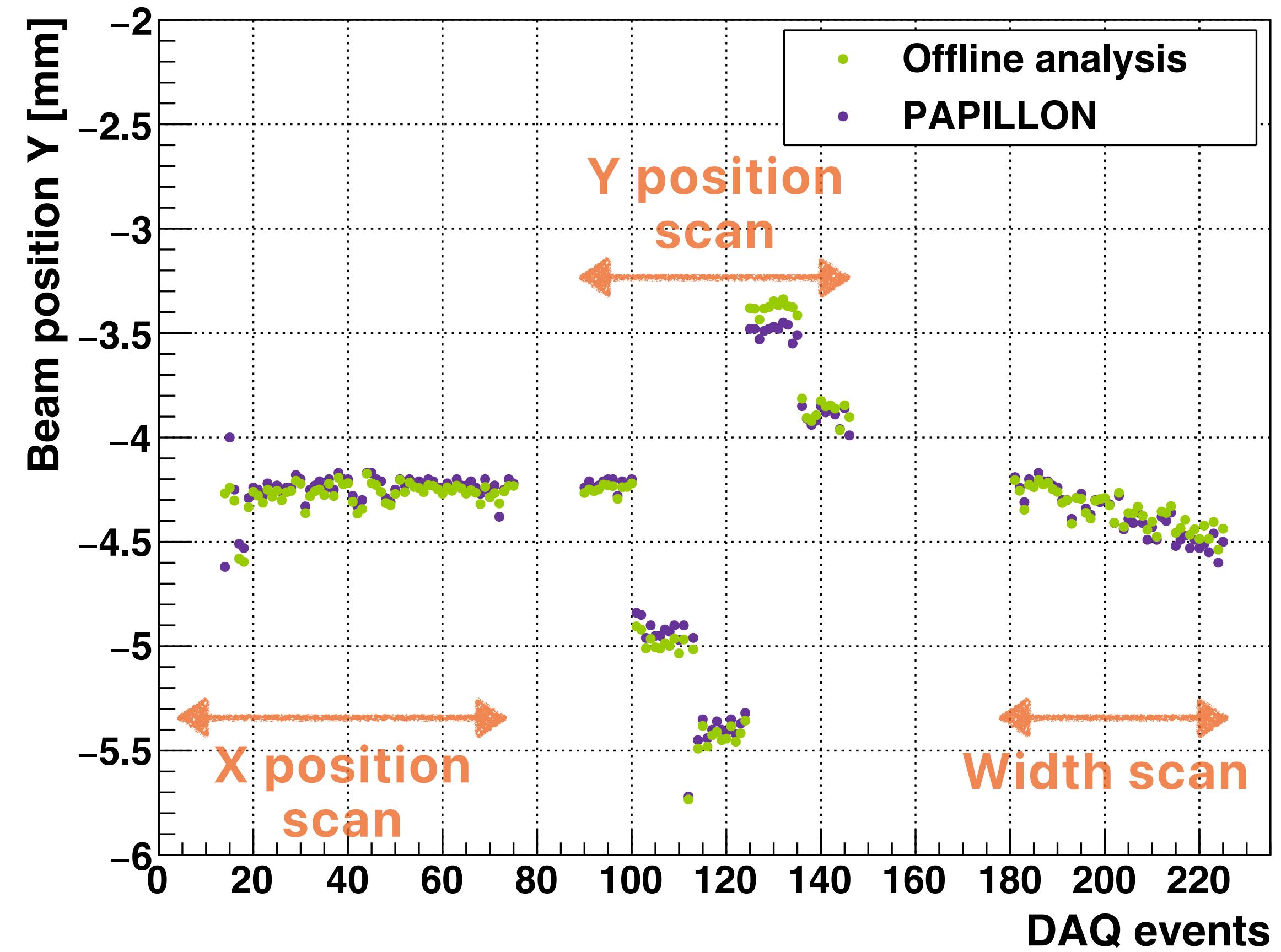
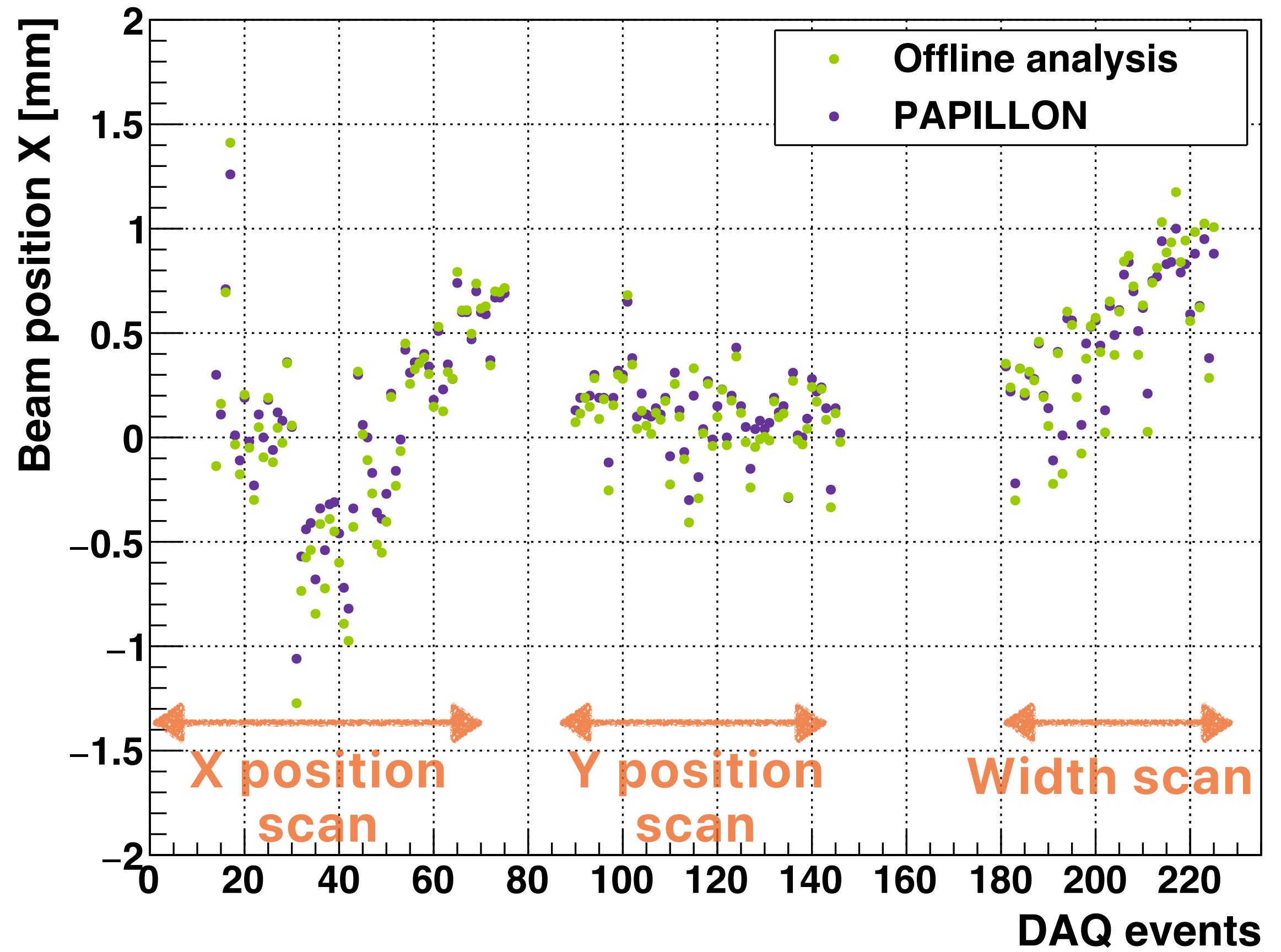
Correlation factor: 0.998

Comparison with Software Expectations (Width)

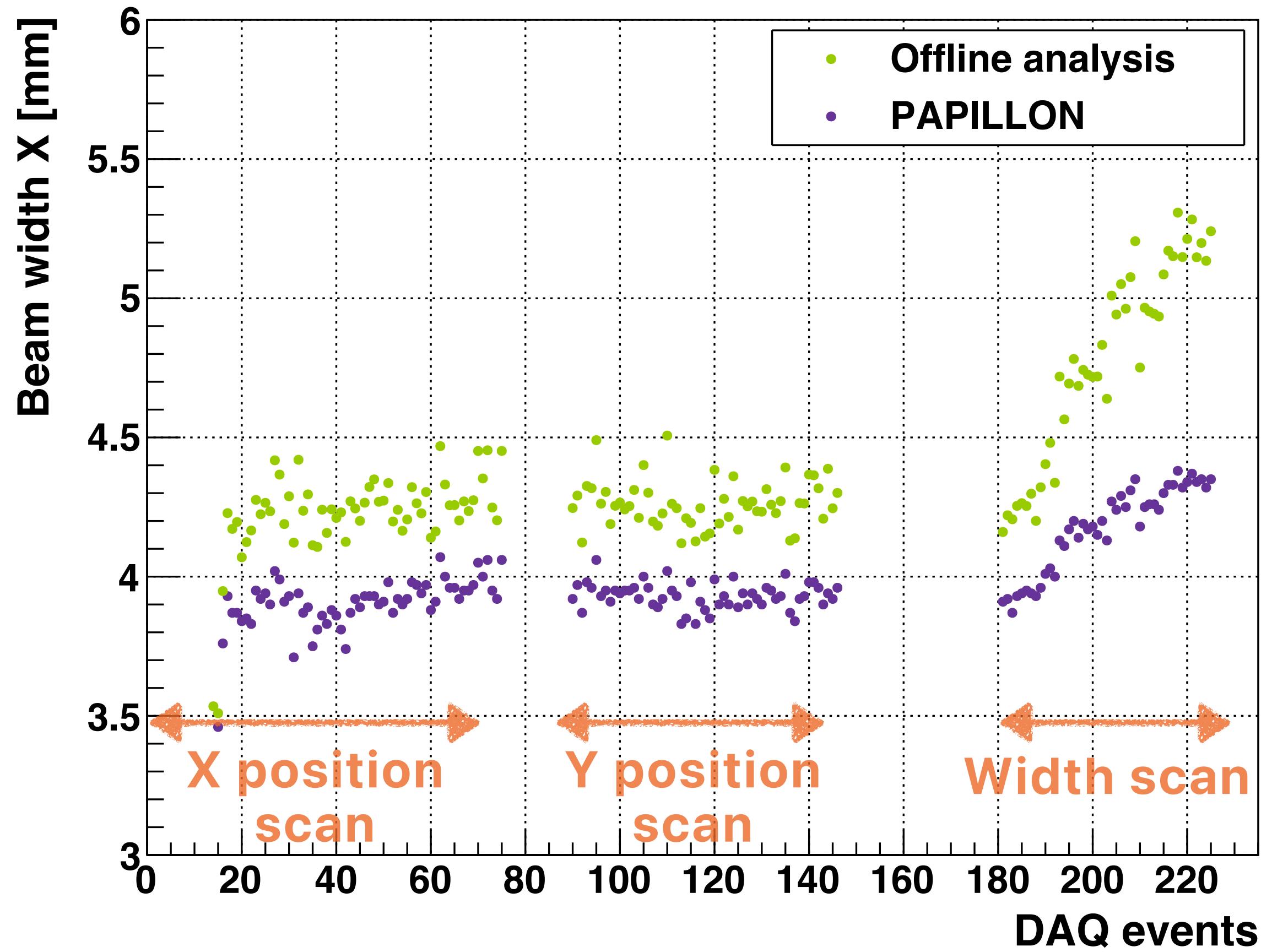


PAPILLON-like analysis used waveform of PAPILLON.

History Plots (Beam Position)



History Plots (Beam Width)

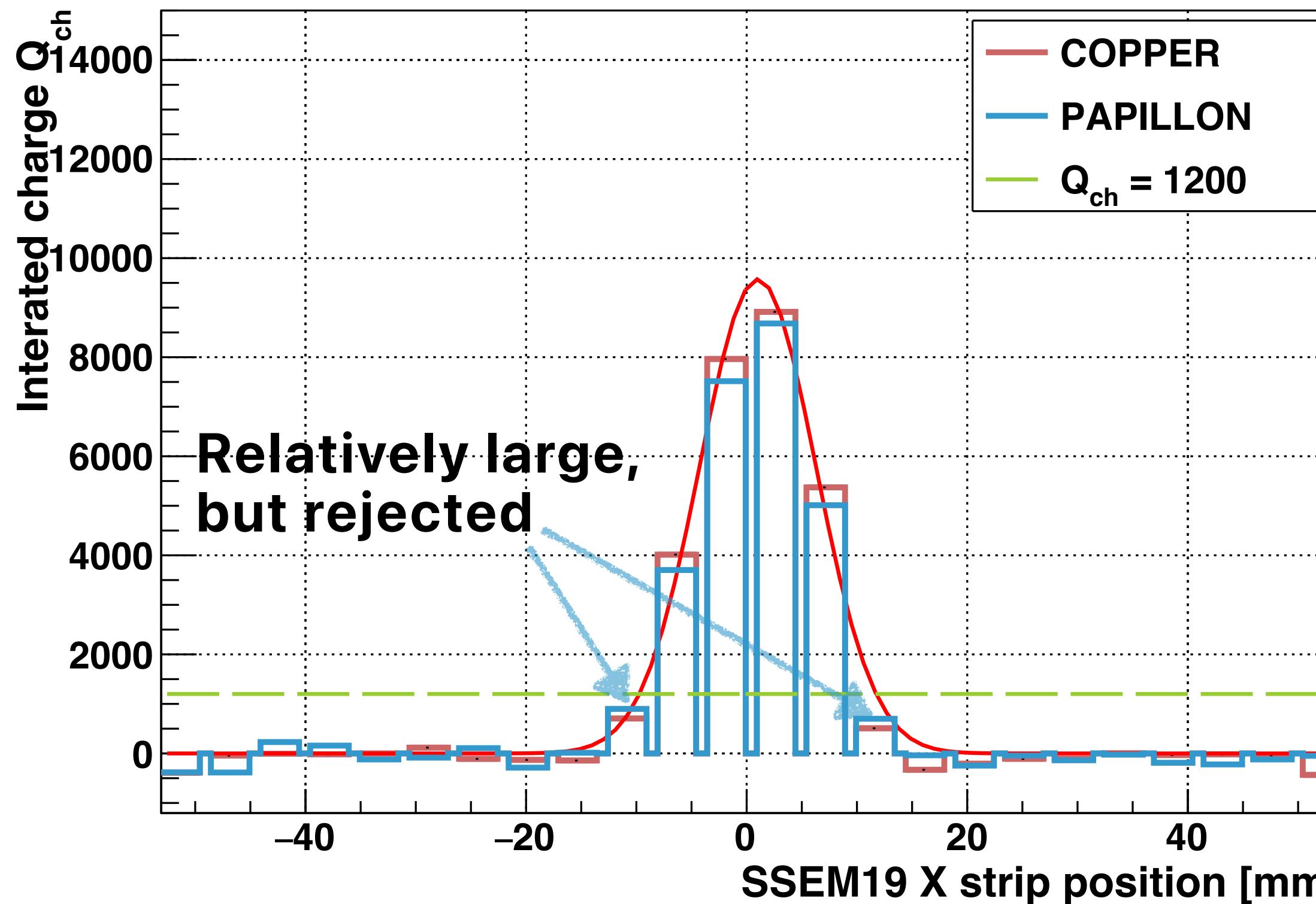


Comparison of Beam Profile (large discrepancy case)

Beam width

PAPILLON : 4.35 mm

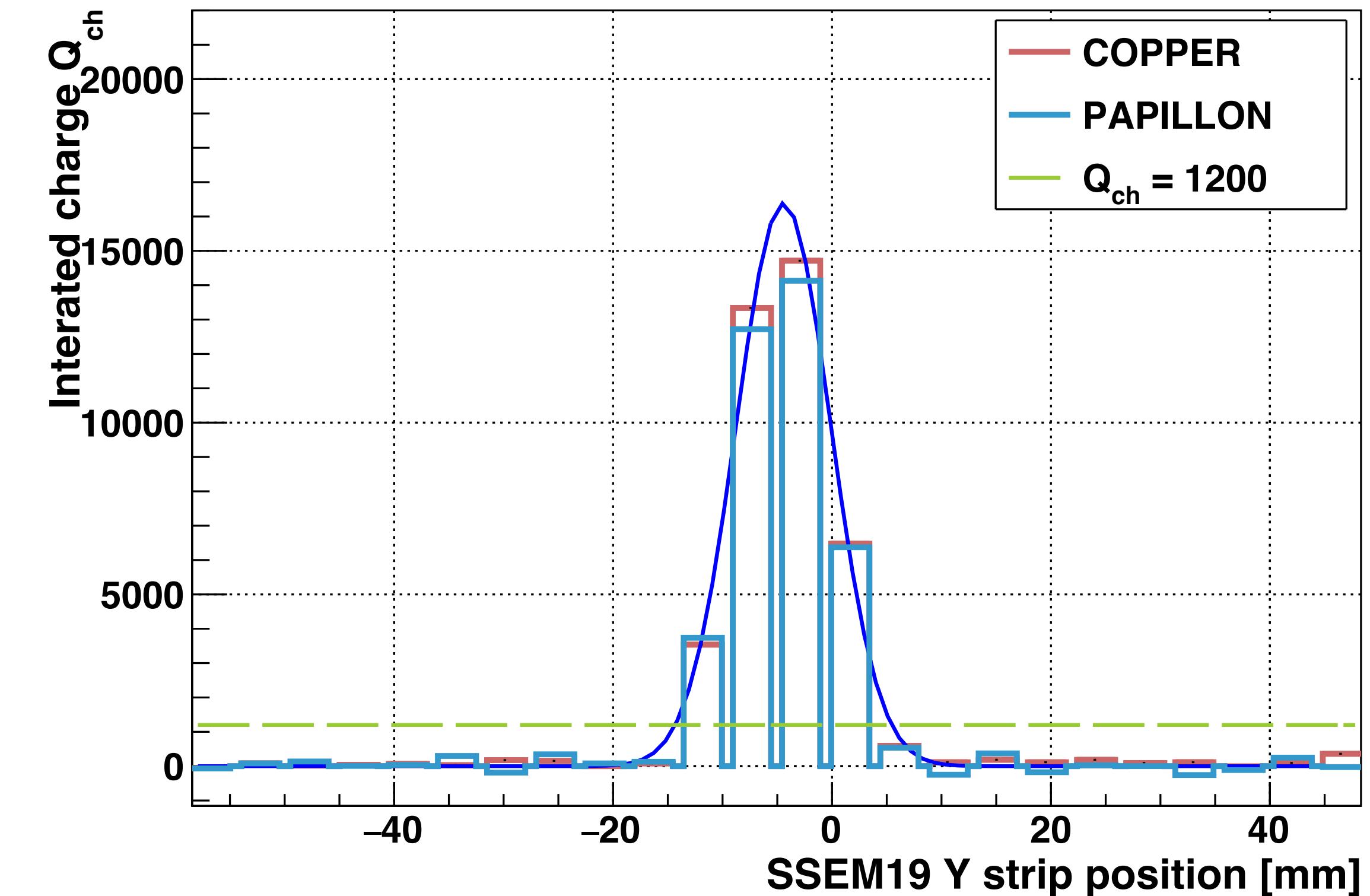
Offline analysis : 5.24 mm



Beam width

PAPILLON : 3.96 mm

Offline analysis : 4.29 mm

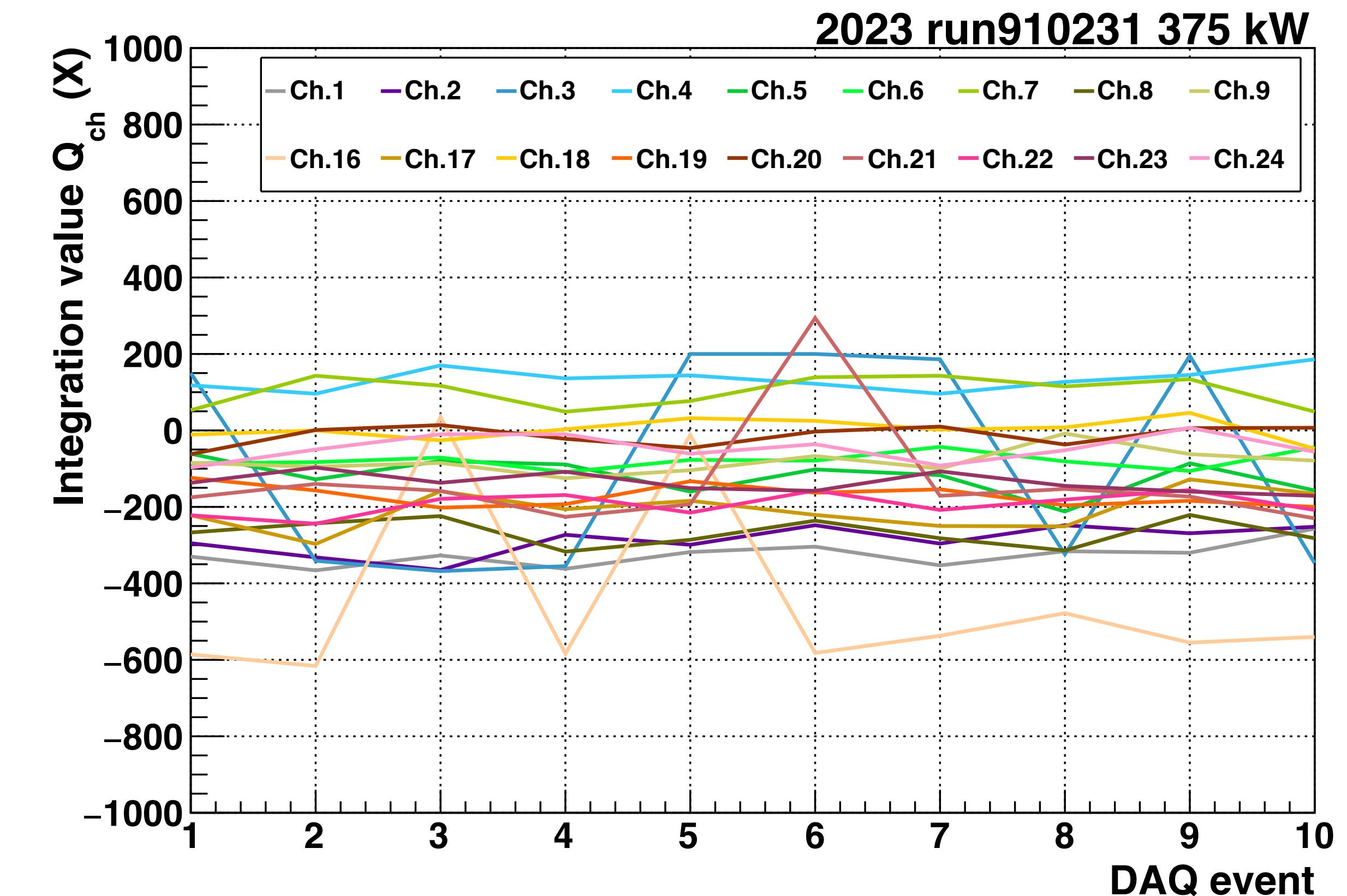
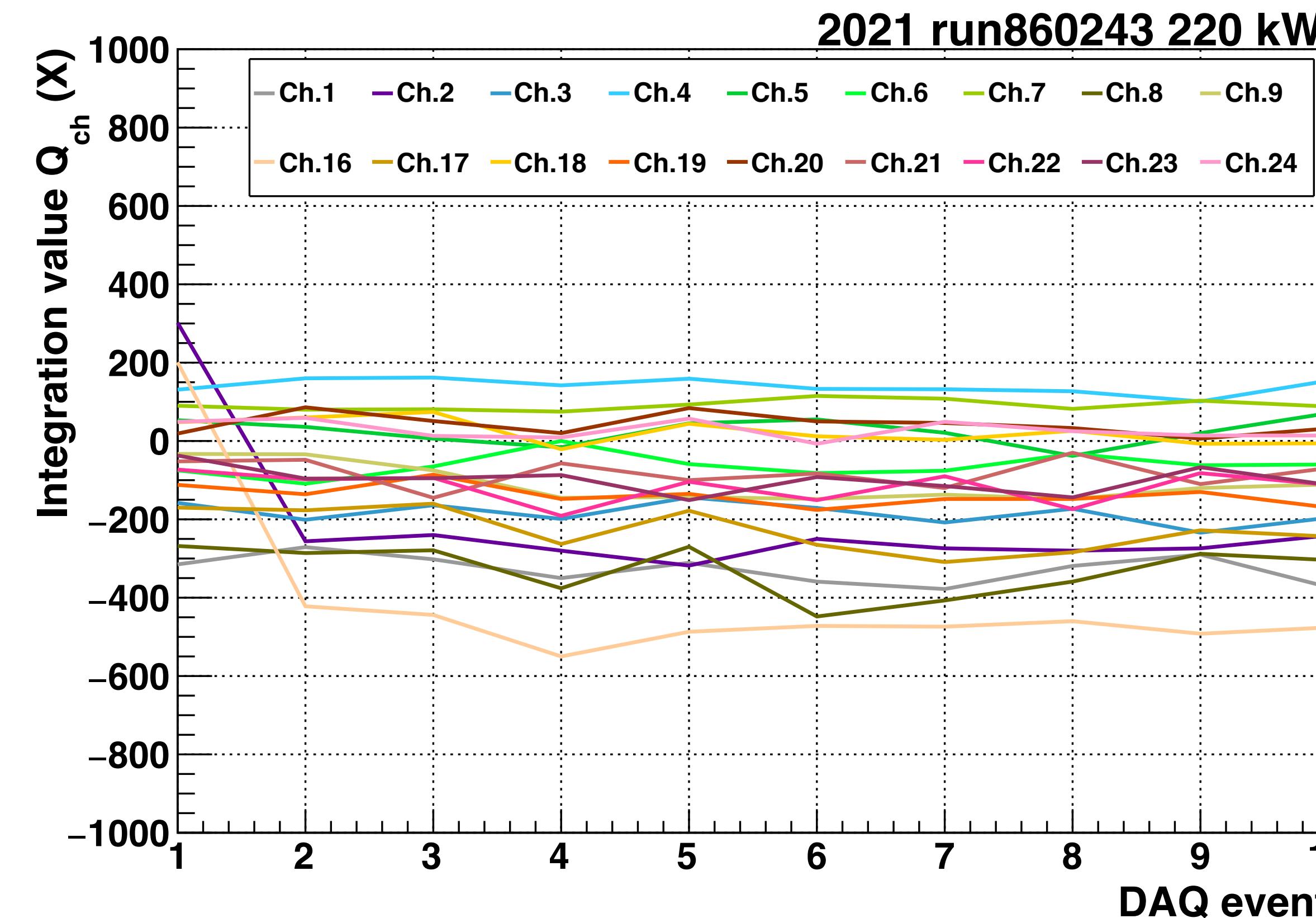


If the threshold is lowered from 1200 to 500 :

PAPILLON beam width: 5.05 mm (X), 4.14 mm
 Beam position is varied by ~0.1 mm ([backup](#))

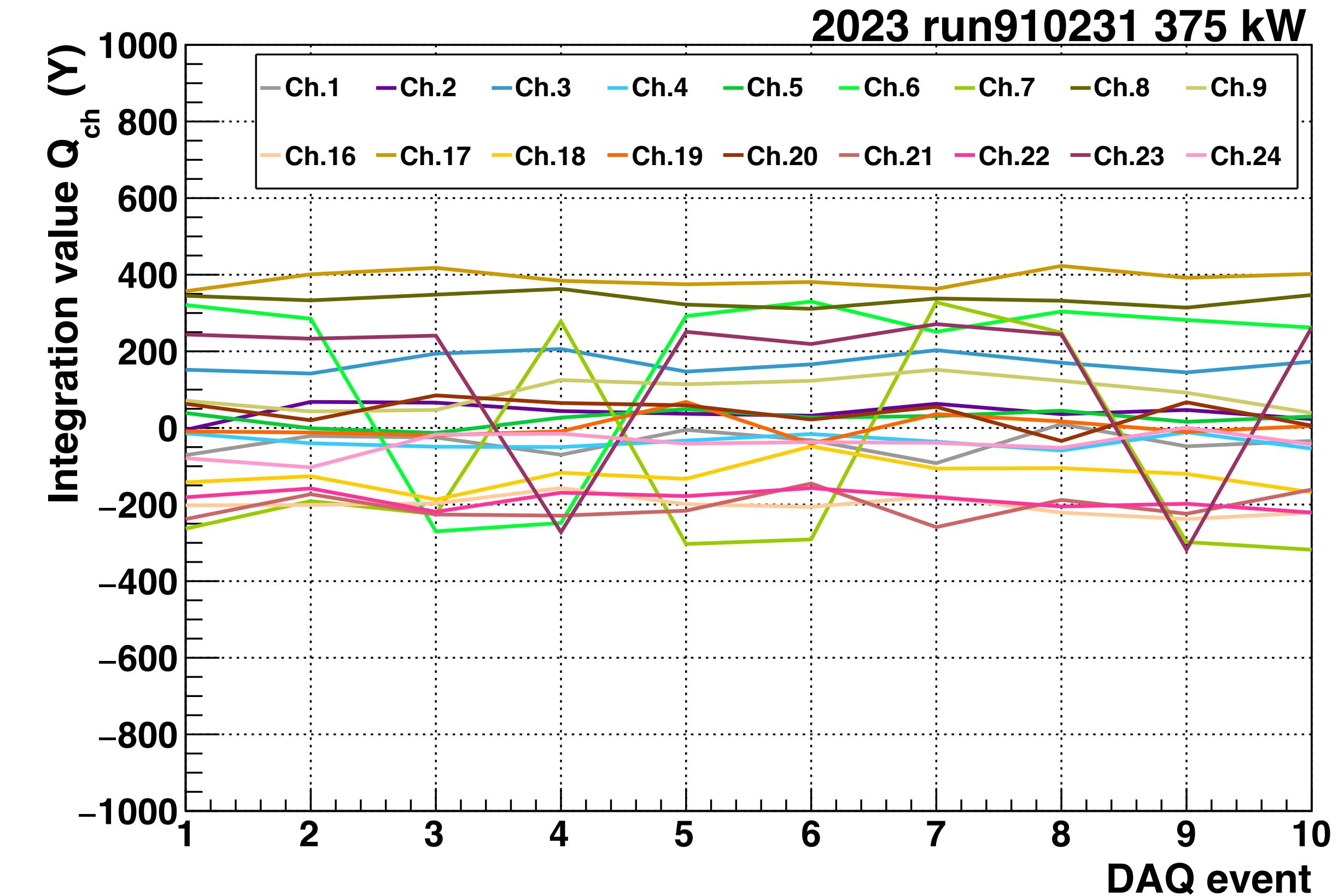
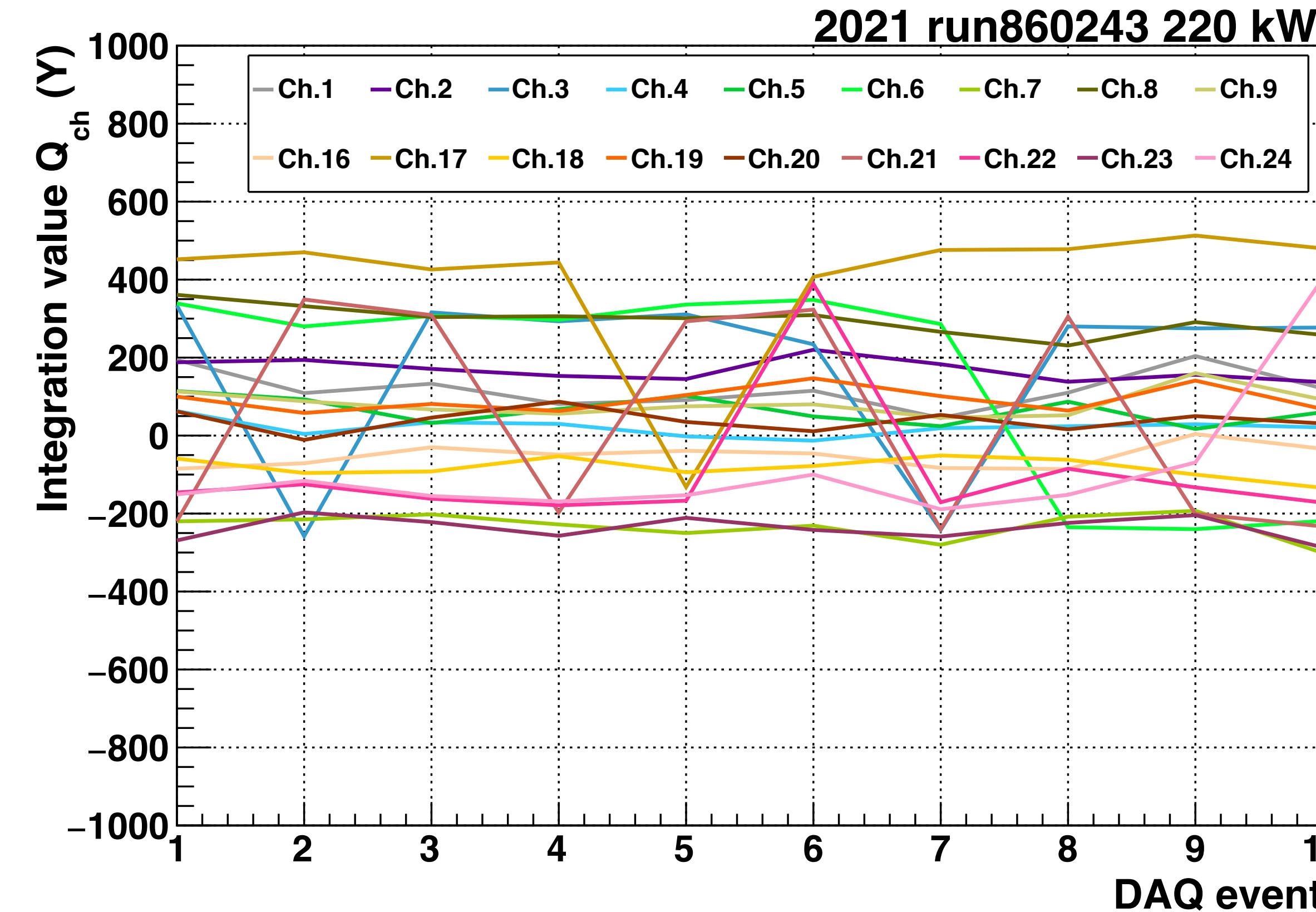
Run910323 ev79
 (width scan)

Contribution of Edge Strips (X)



Q_{ch} @edge strip does not change even at ~1.7 times beam intensity.
 → We may change the threshold e.g. 1200→500.

Contribution of Edge Strips (Y)



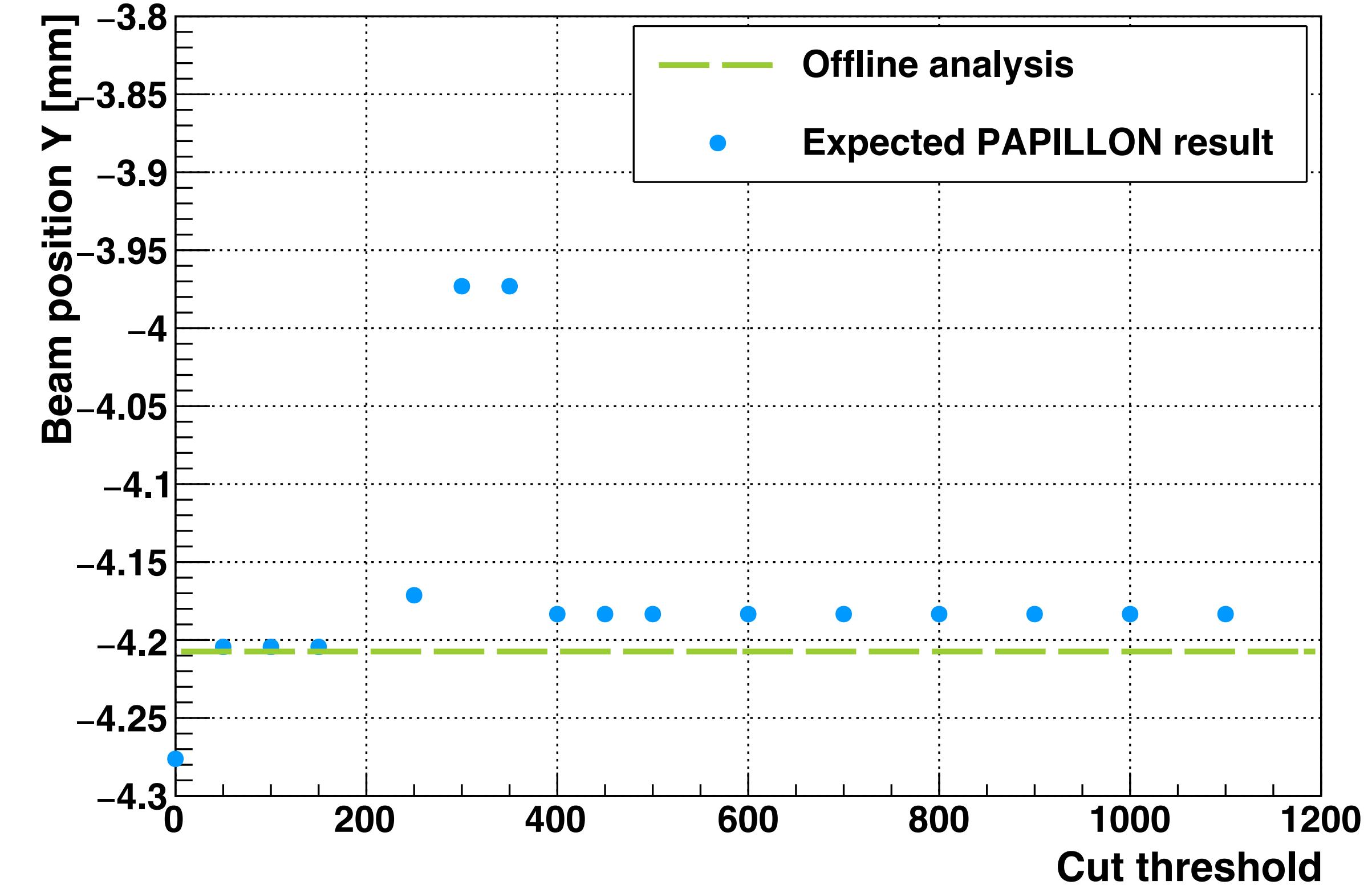
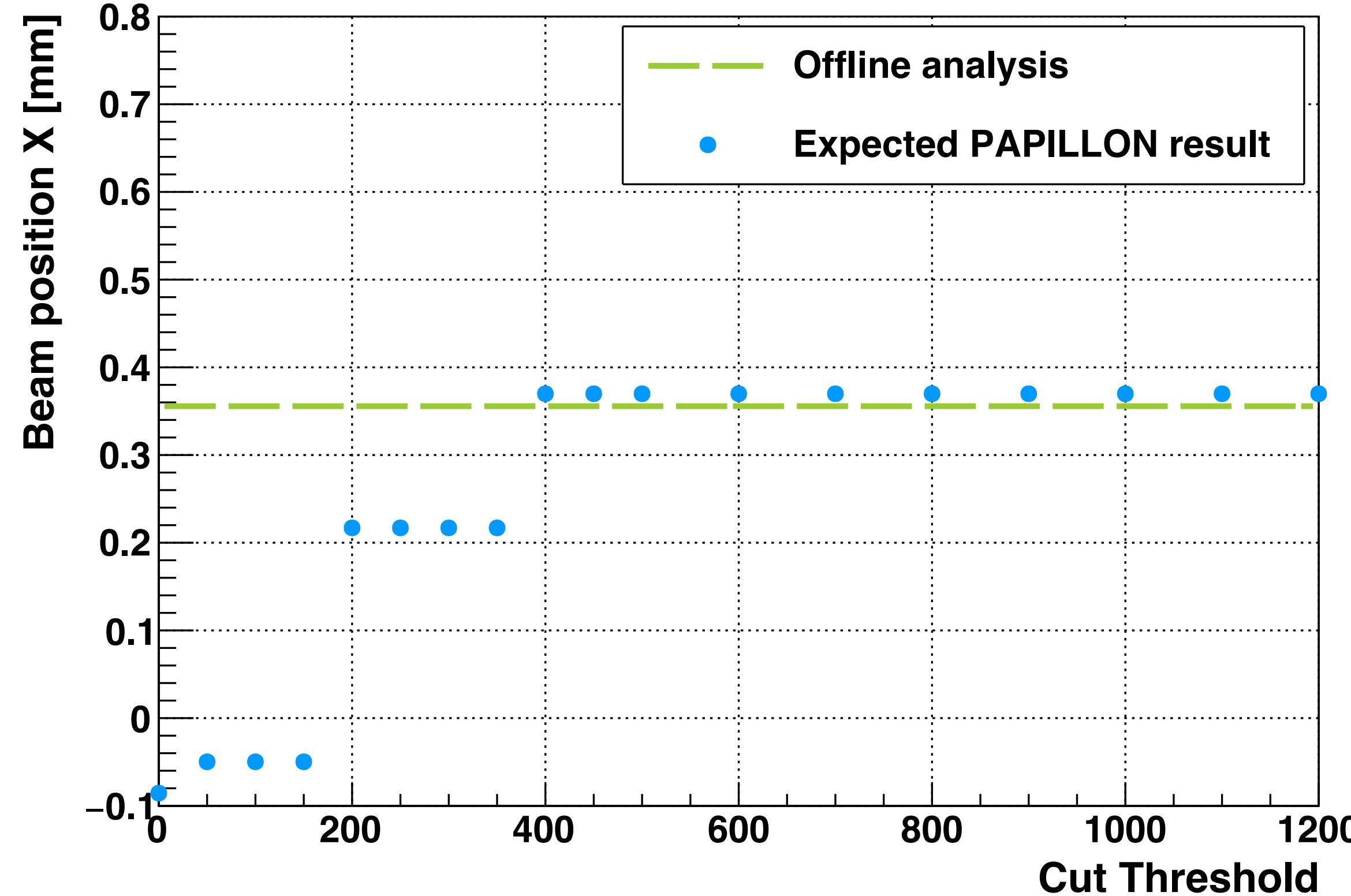
Q_{ch} @edge strip does not change even at ~1.7 times beam intensity.
 → We may change the threshold e.g. 1200→500.



Backup

Beam Position under Different Q_{ch} Cut

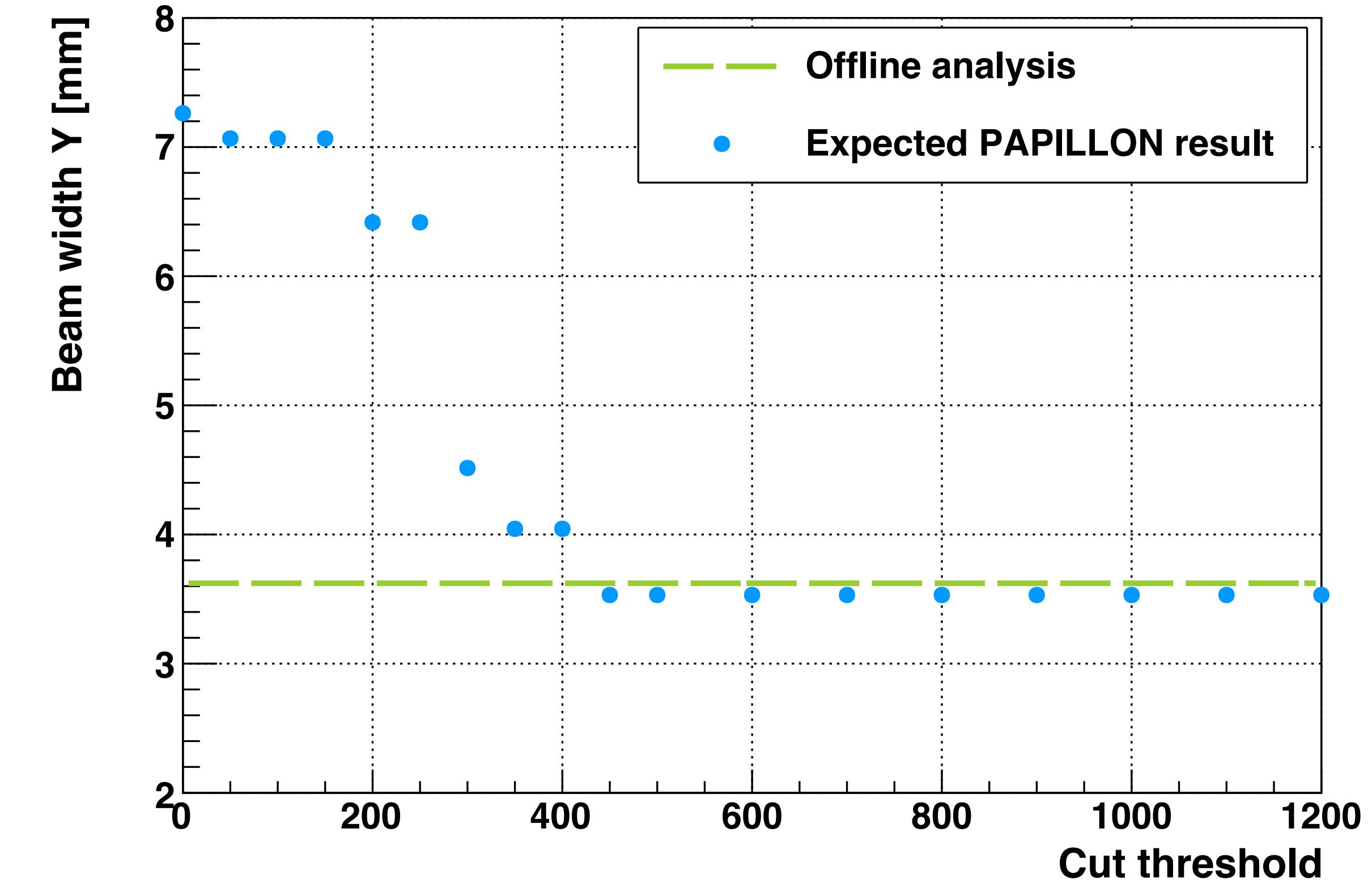
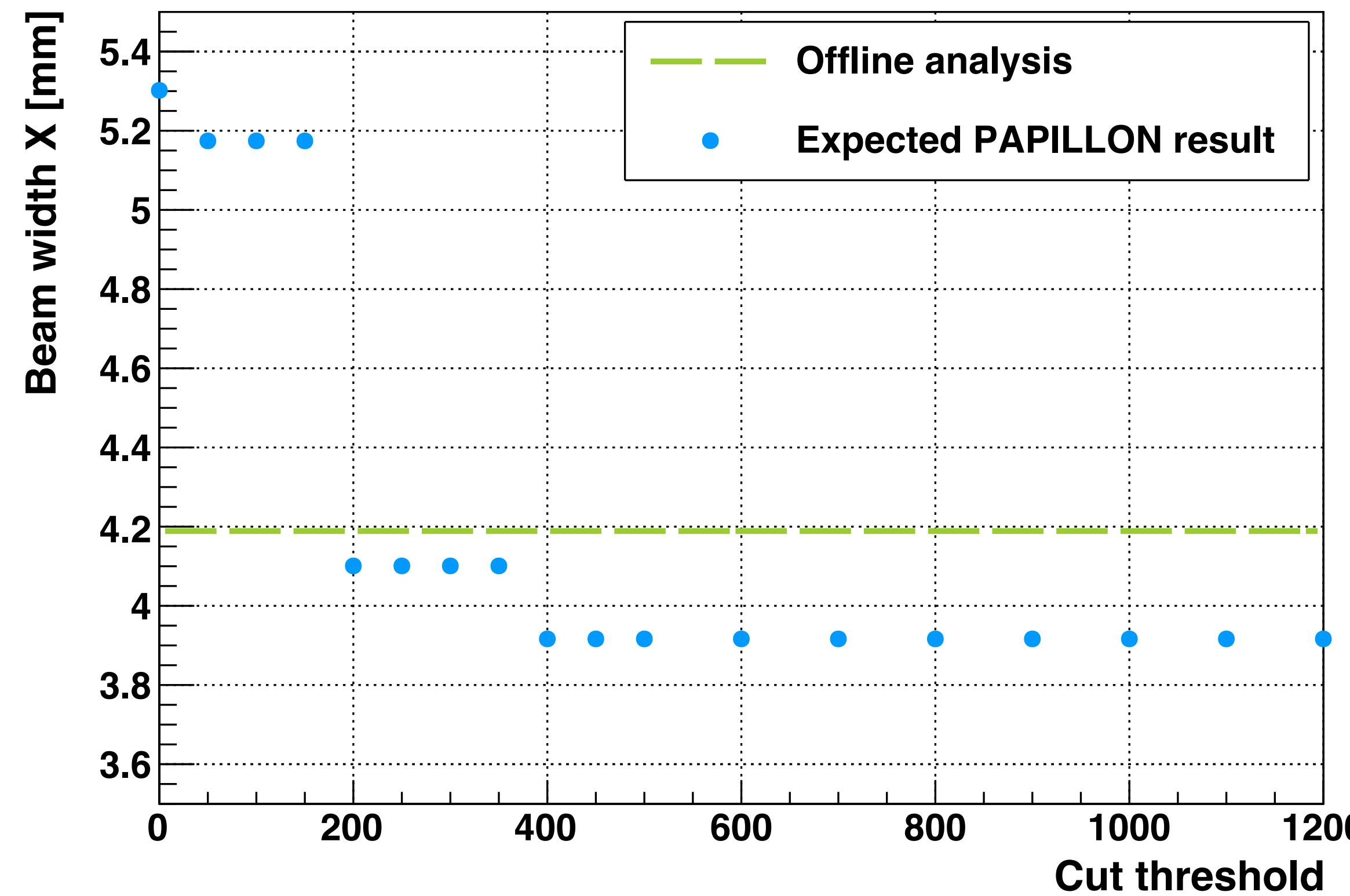
Run910321 ev47
(X position scan)



Results of threshold = 400 - 1200 are same.

Beam Width under Different Q_{ch} Cut

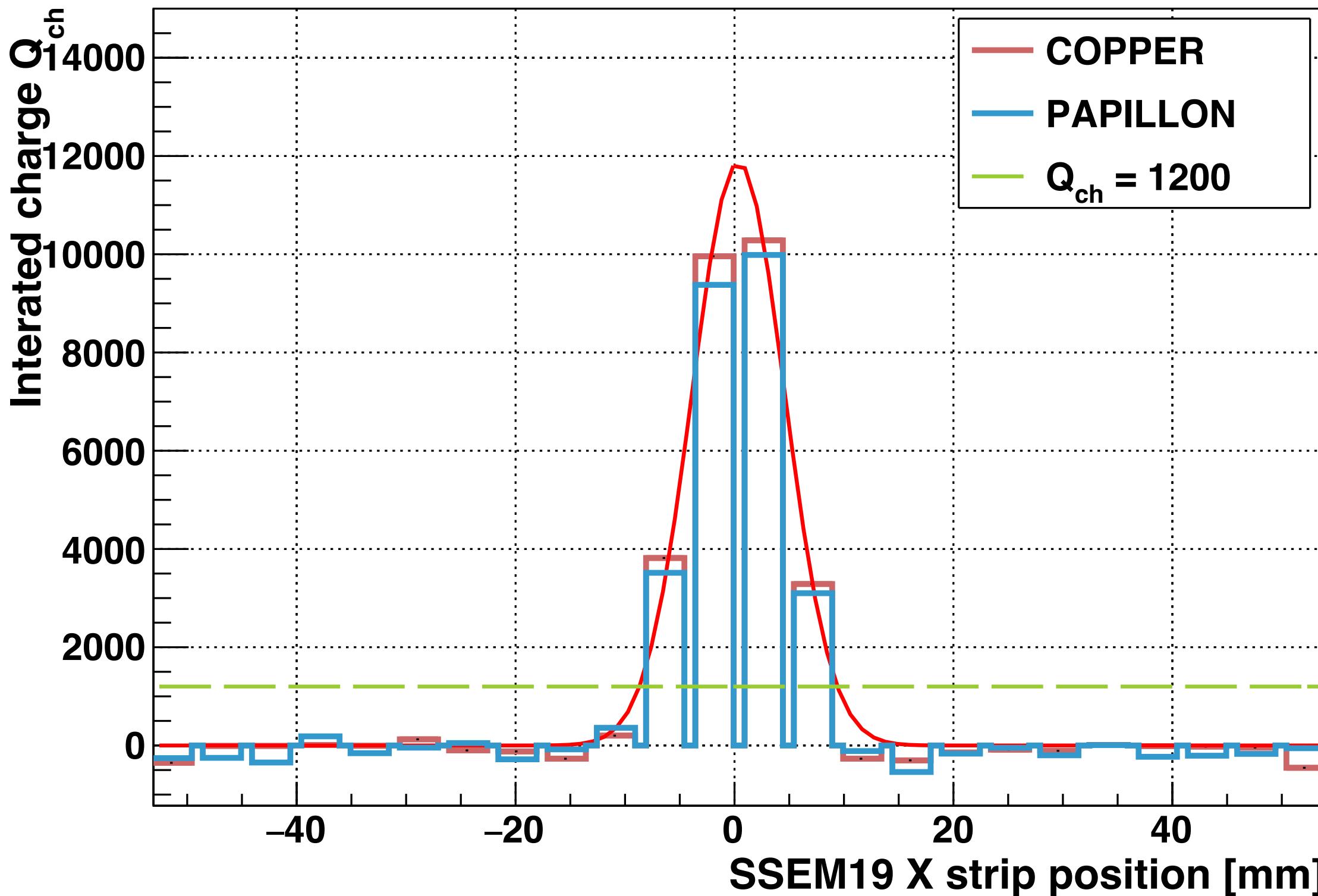
Run910321 ev47
(X position scan)



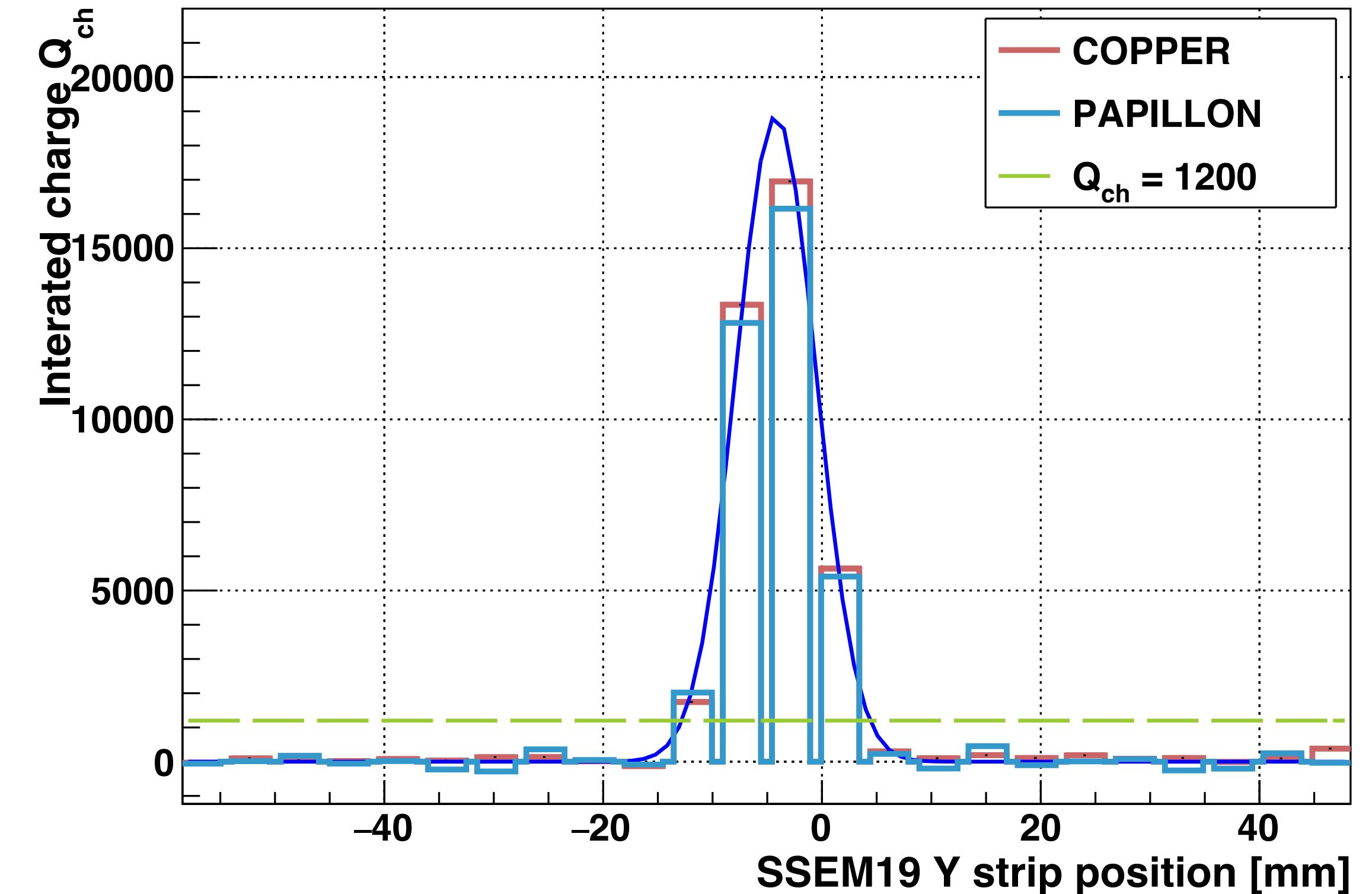
Results of threshold = 400 - 1200 are same.

Comparison of Beam Profile (typical case)

Beam width
PAPILLON : 3.91 mm
Offline analysis : 4.19 mm



Beam width
PAPILLON : 3.53 mm
Offline analysis : 3.62 mm

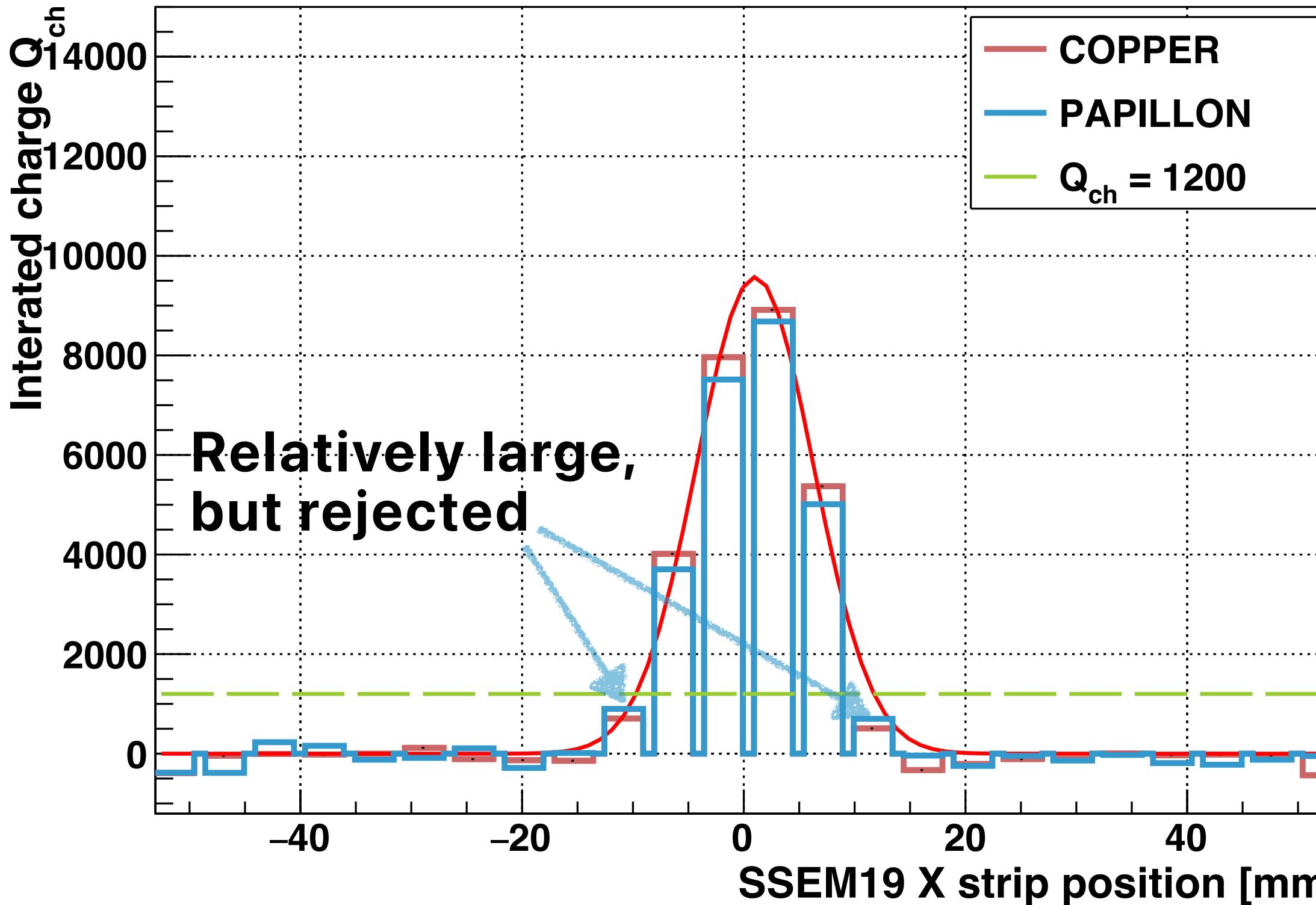


COPPER: after creating a profile for each bunch, add them together.
PAPILLON: Create a profile by spill unit.

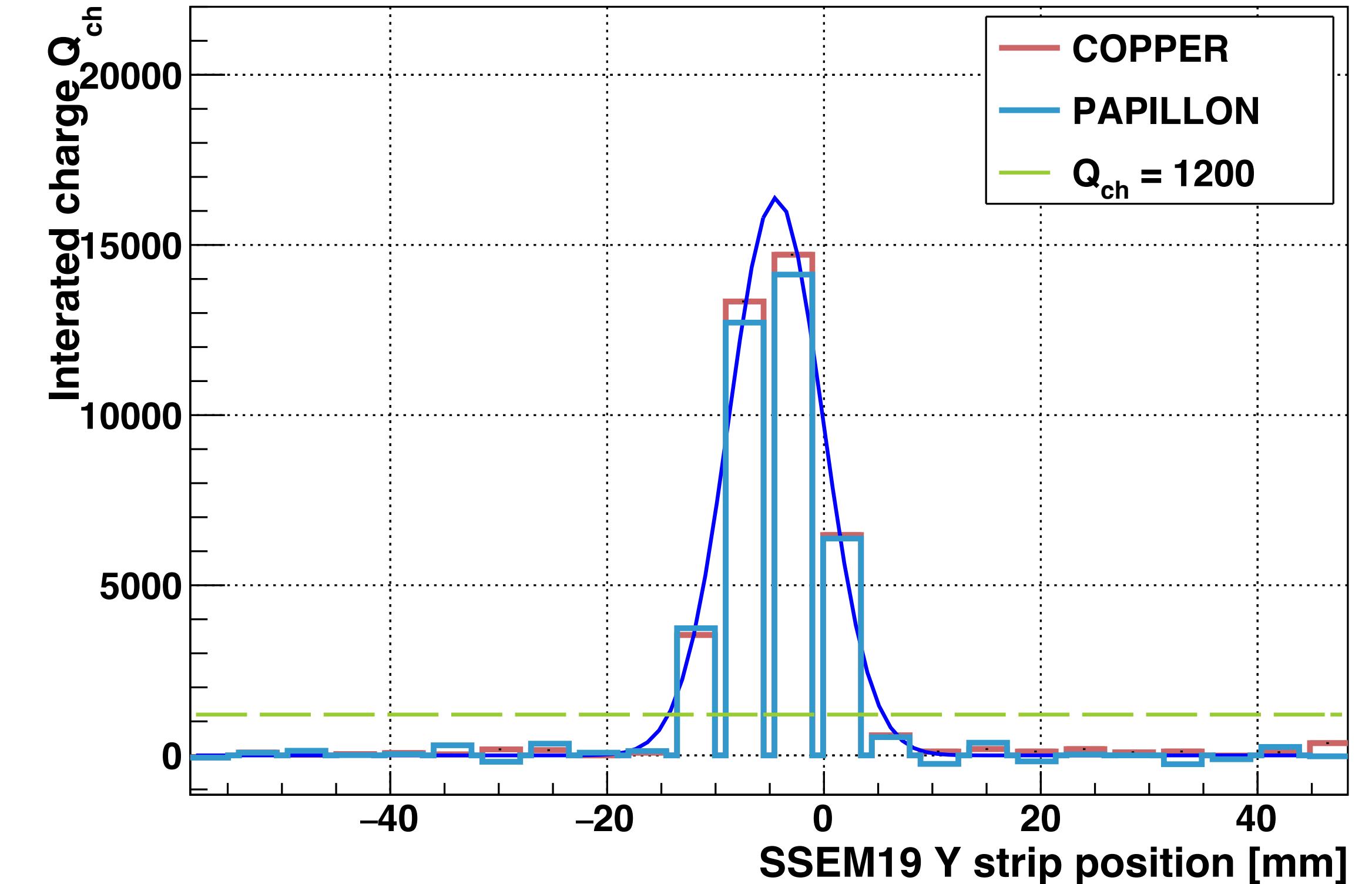
Run910321 ev47
(X position scan)

Comparison of Beam Profile (large discrepancy case)

Beam position
PAPILLON : 0.88 mm
Offline analysis : 1.00 mm



Beam position
PAPILLON : -4.5 mm
Offline analysis : -4.44 mm



If the threshold is lowered from 1200 to 500 :
 PAPILLON beam position: 0.77 mm (X), -4.35 mm (Y)

Run910323 ev79
 (width scan)