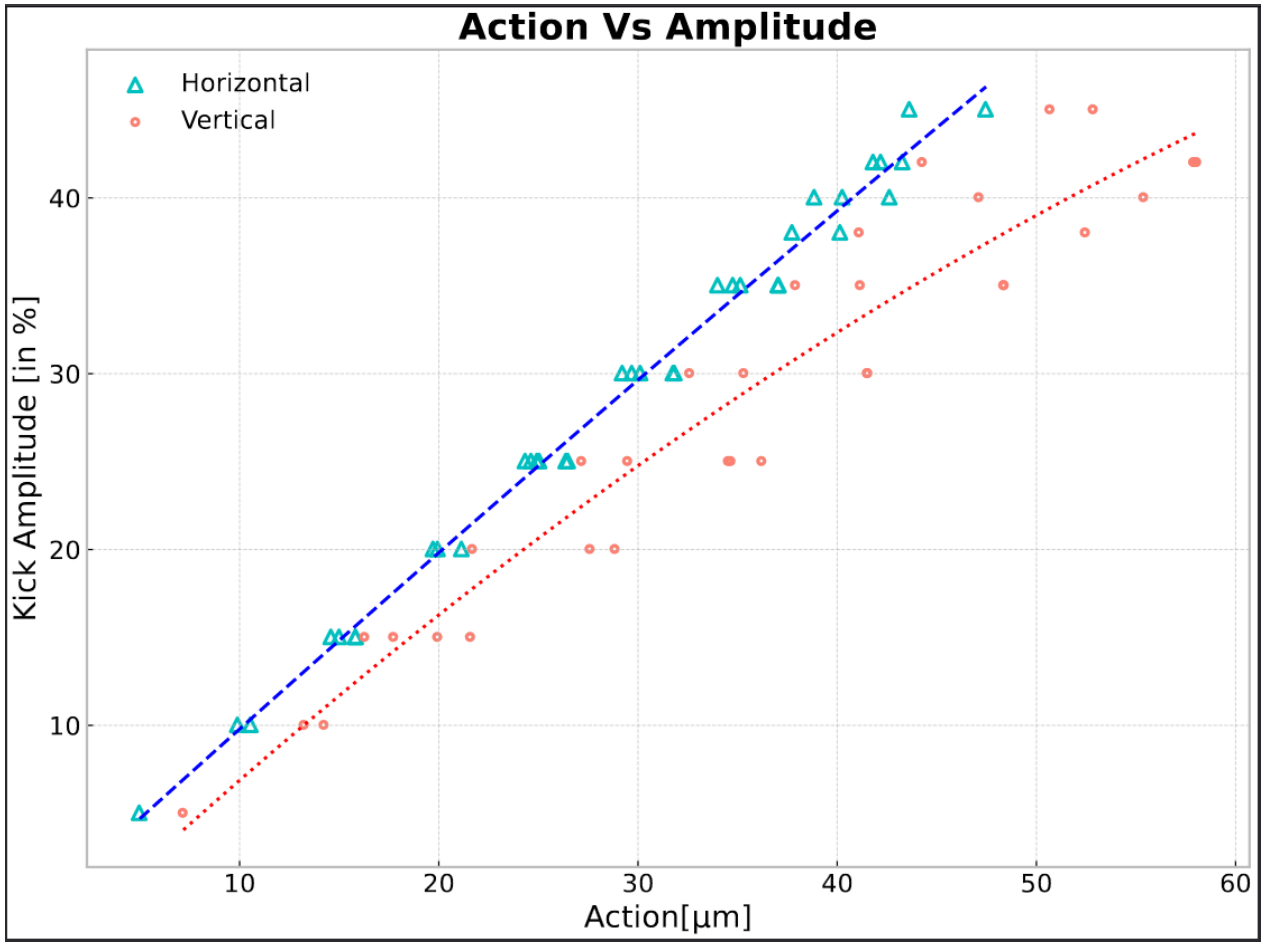
Comparison

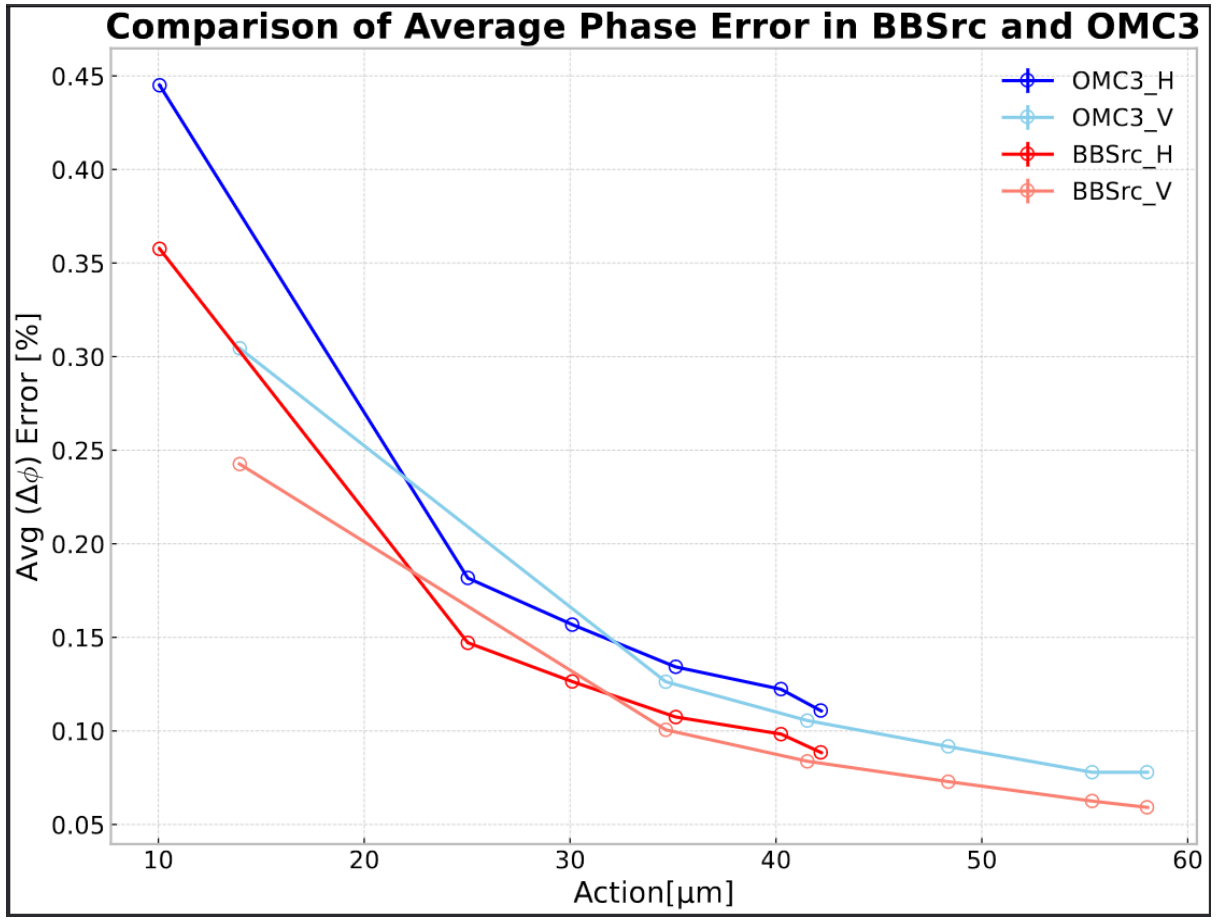
BBSrc and OMC3

Amplitude and Action



- Amplitude of kick is not always linear to Action (especially in the Vertical Plane).
- Vertical Action consistently has higher Action values than Horizontal Action for any given kick amplitude.
- Function:
  - Horizontal: $y = 9.77x + 0.193$
  - Vertical: $y = 10.7x - 4.56x^2 - 3.444$

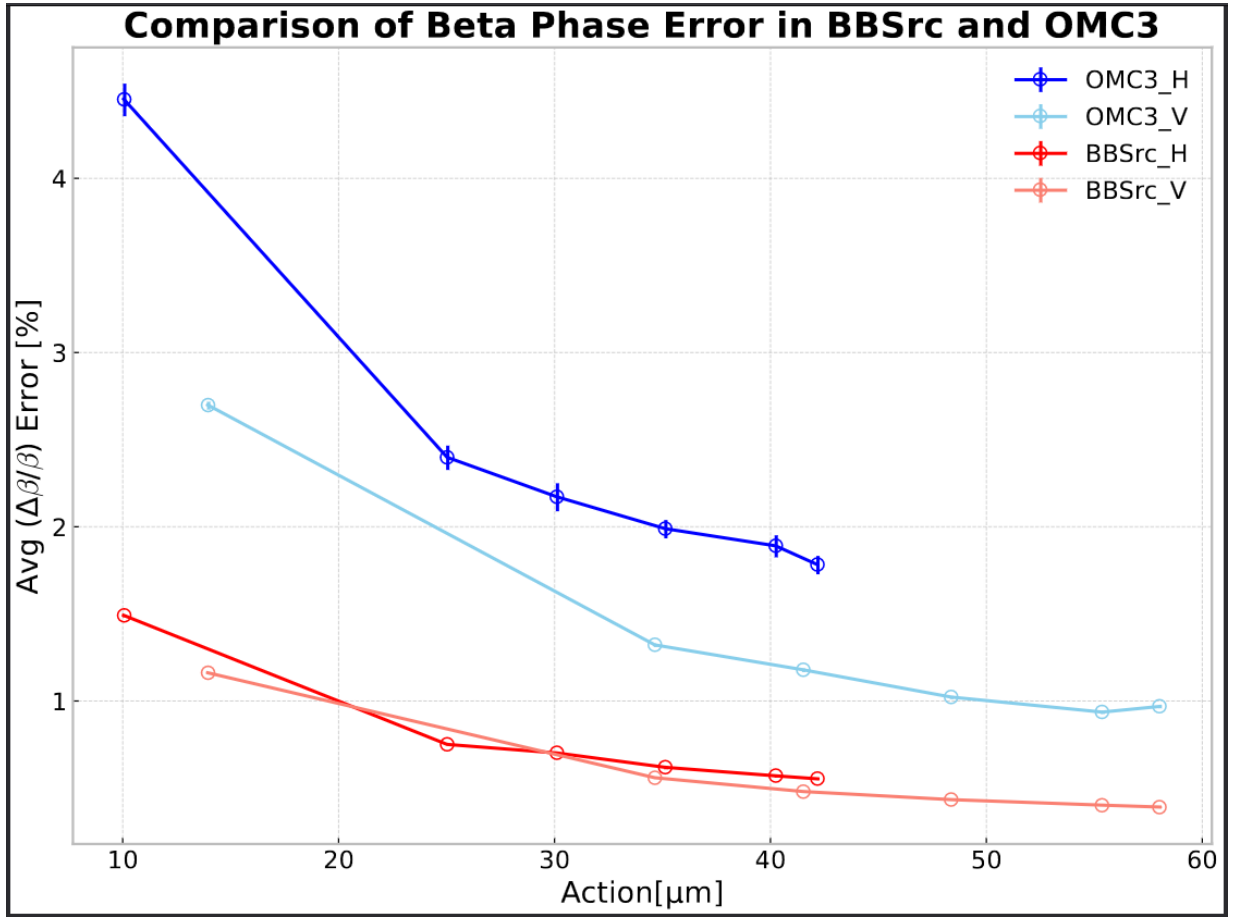
Comparison of Phase Error in BBSrc and OMC3



- Average Phase Error is smaller in BBSrc than in OMC.

- Beam 1 - 30cm
- Fill No. = 9403
- Model:
  - BBSrc: B1_30cm_22-03-2024
  - OMC3: B1_30cm_for_global_corrections_with_knobs

Comparison of BetaPhase Error in BBSrc and OMC3

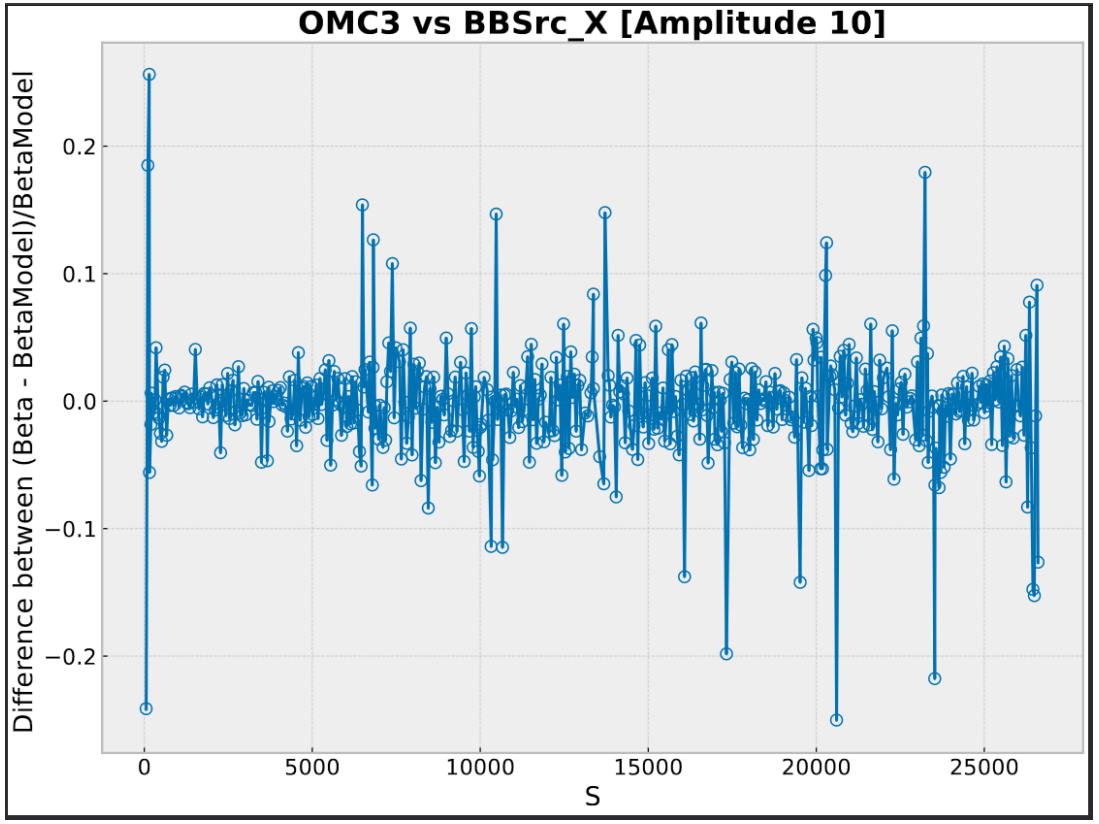


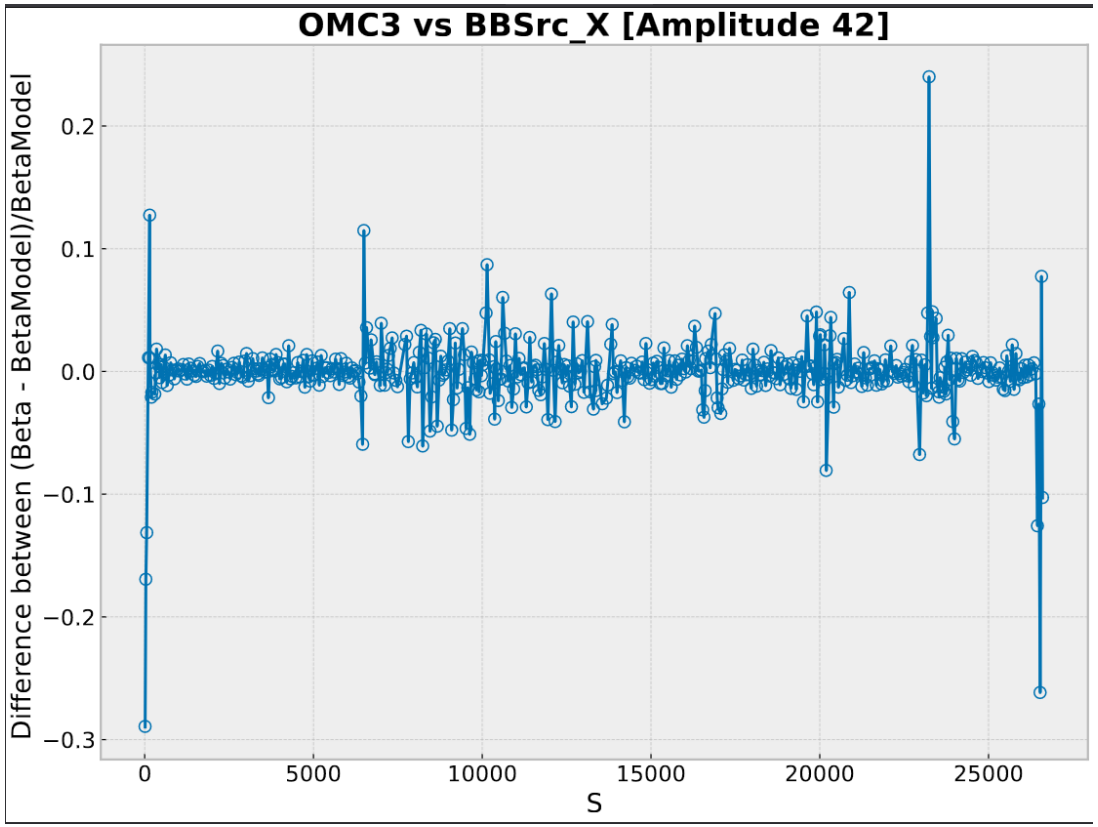
- Errorbars are smaller in BBSrc than in OMC.
- Error is smaller in BBSrc in both horizontal and vertical

  –> difference of approx. 2x.

- Beam 1 - 30cm
- Fill No. = 9403
- Model:
  - BBSrc: B1_30cm_22-03-2024
  - OMC3: B1_30cm_for_global_corrections_with_knobs

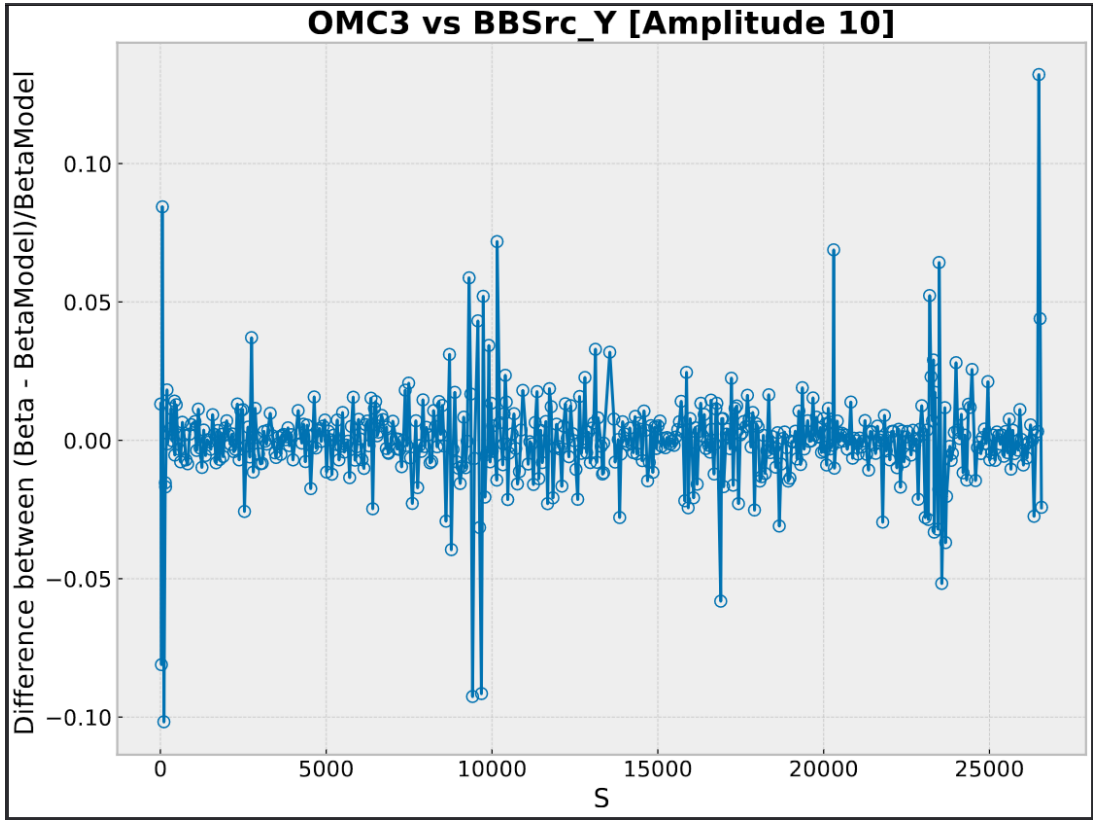
Difference in Horizontal

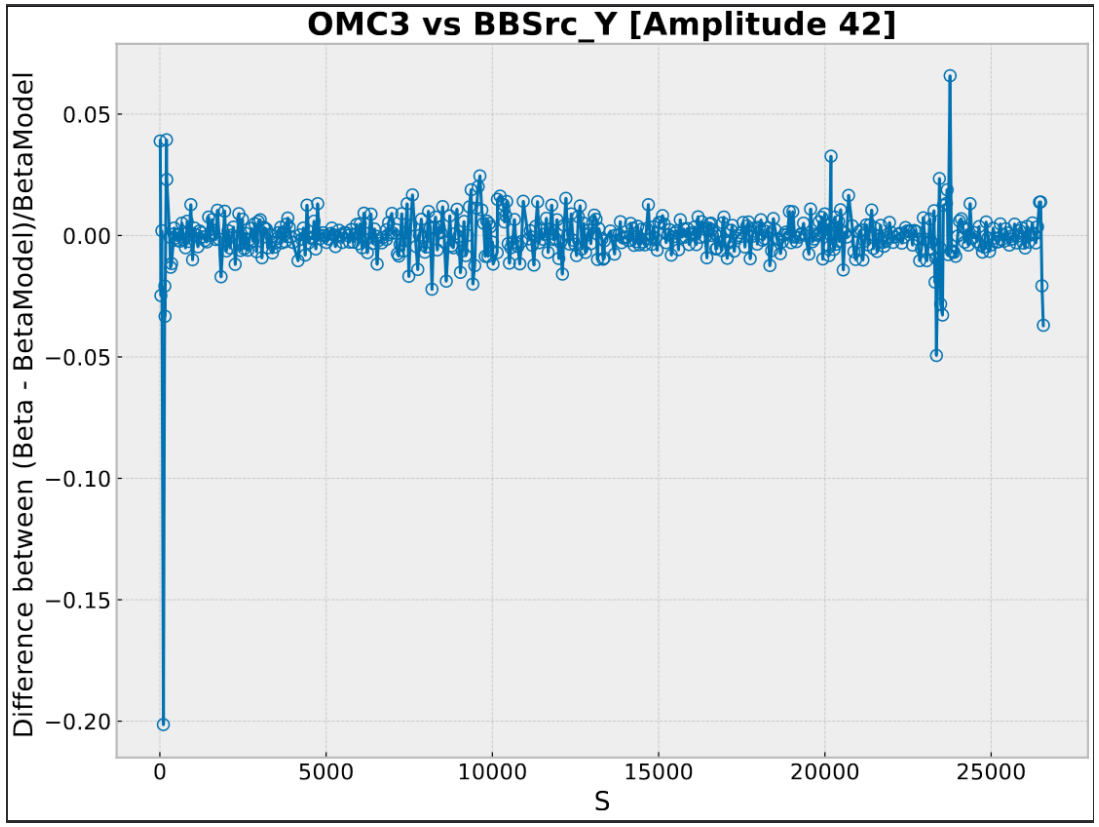




- Beam 1
- Fill No. = 9403

Difference in Vertical





- Beam 1
- Fill No. = 9403

Conclusion

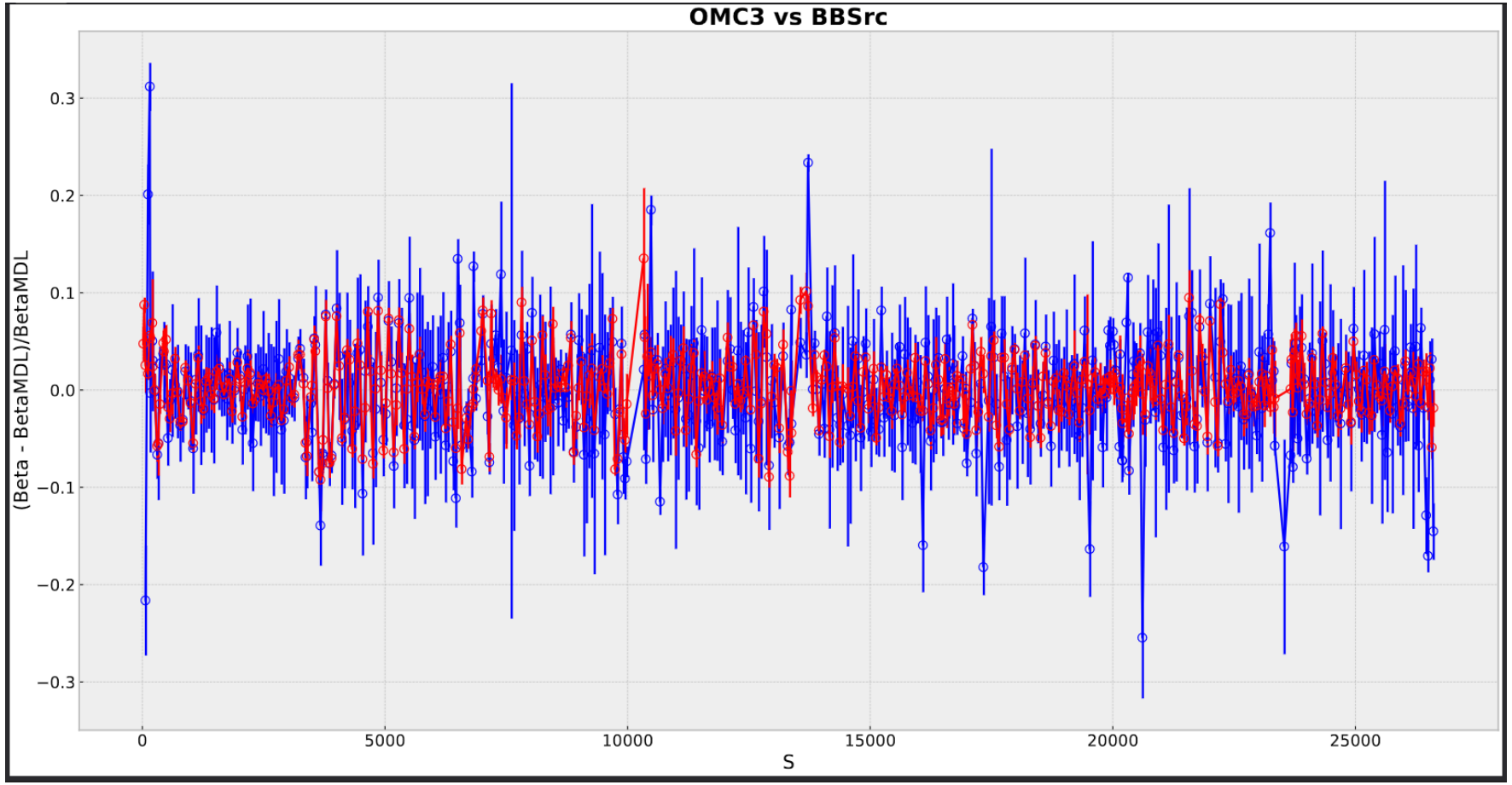
- For same fill, BBSrc consistently has lower errors compared to OMC3 across the range of actions, with the difference becoming less pronounced at higher actions..

- Amplitude has a more non-linear relationship to the Action in the vertical.

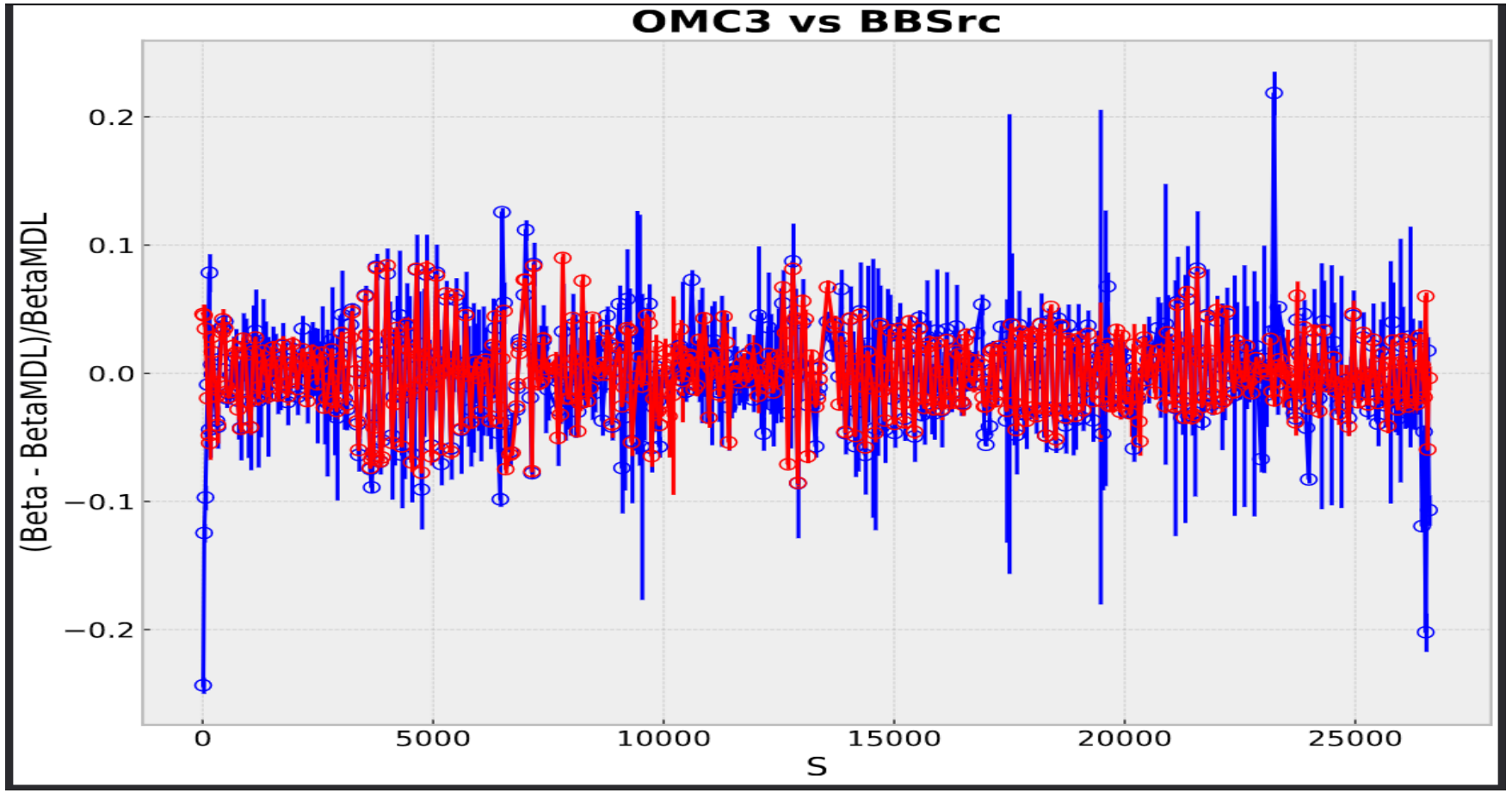
  [Can be considered when taking readings/kicking in both planes.]

Extras

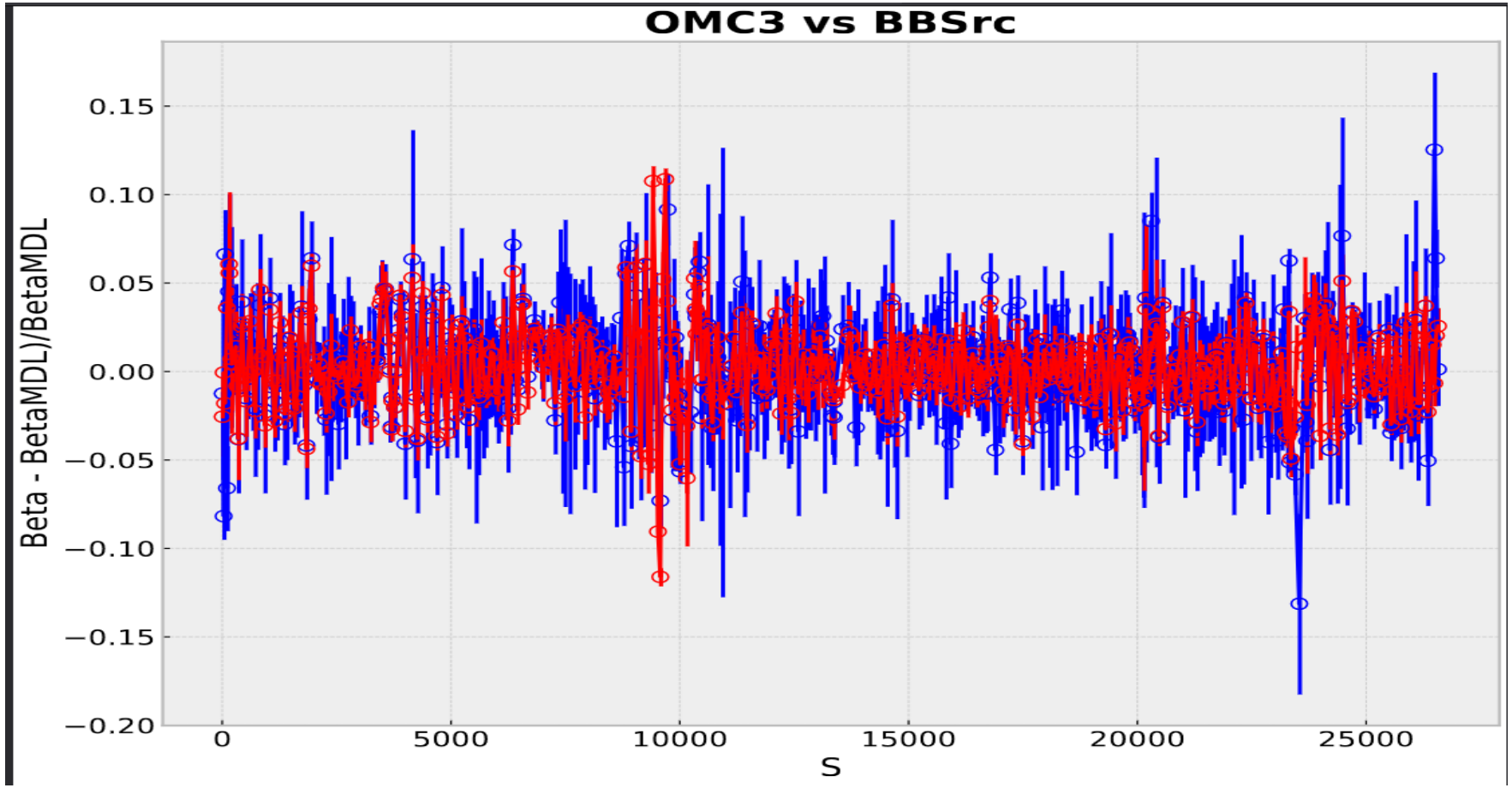
10_X


OMC3 vs BBSrc
(Beta - BetaMDL)/BetaMDL
0.3
0.2
0.1
0.0
−0.1
−0.2
−0.3
0
5000
10000
15000
20000
25000
S

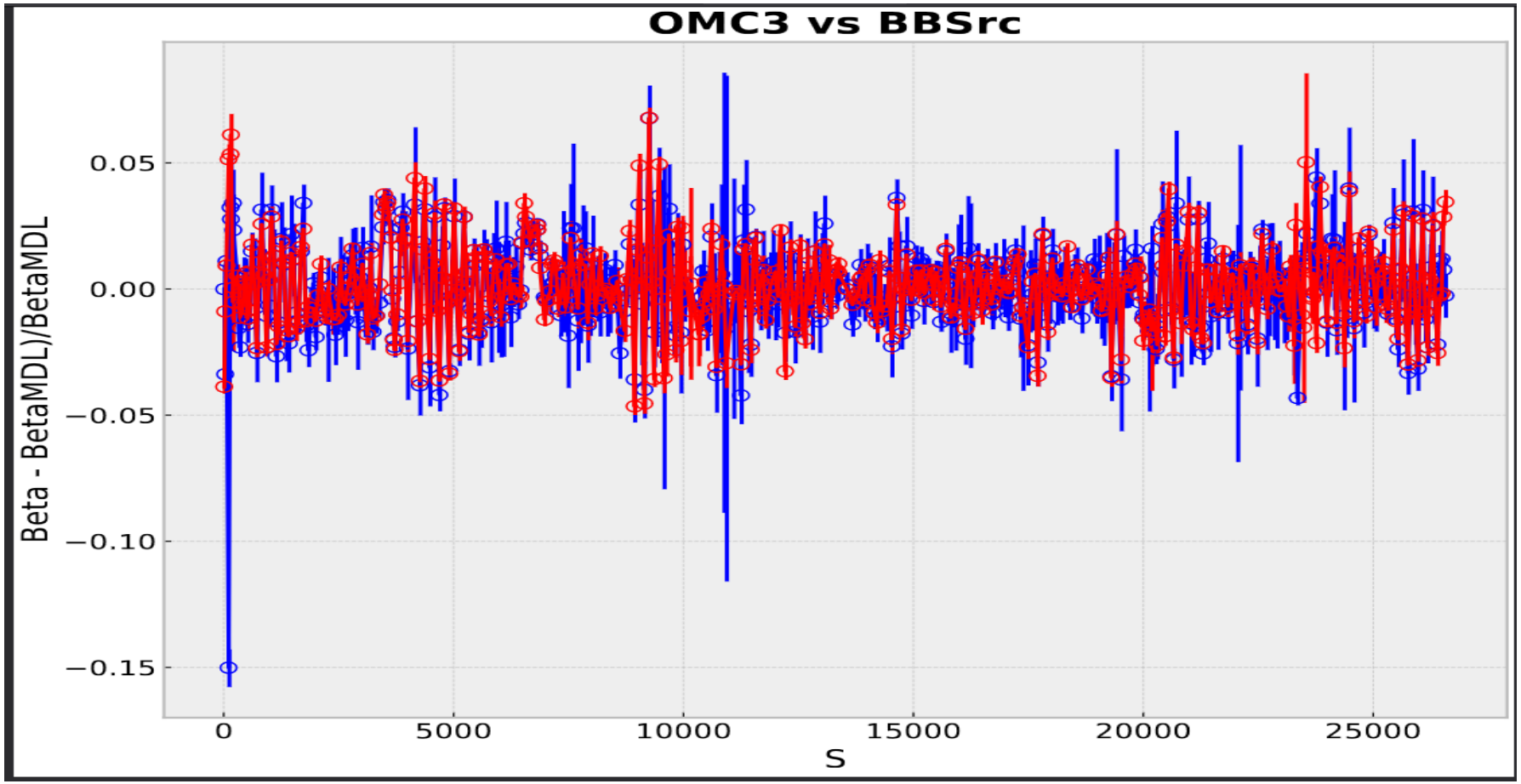
42_X


OMC3 vs BBSrc
(Beta - BetaMDL)/BetaMDL
0.2
0.1
0.0
−0.1
−0.2
0
5000
10000
15000
20000
25000
S

10_Y

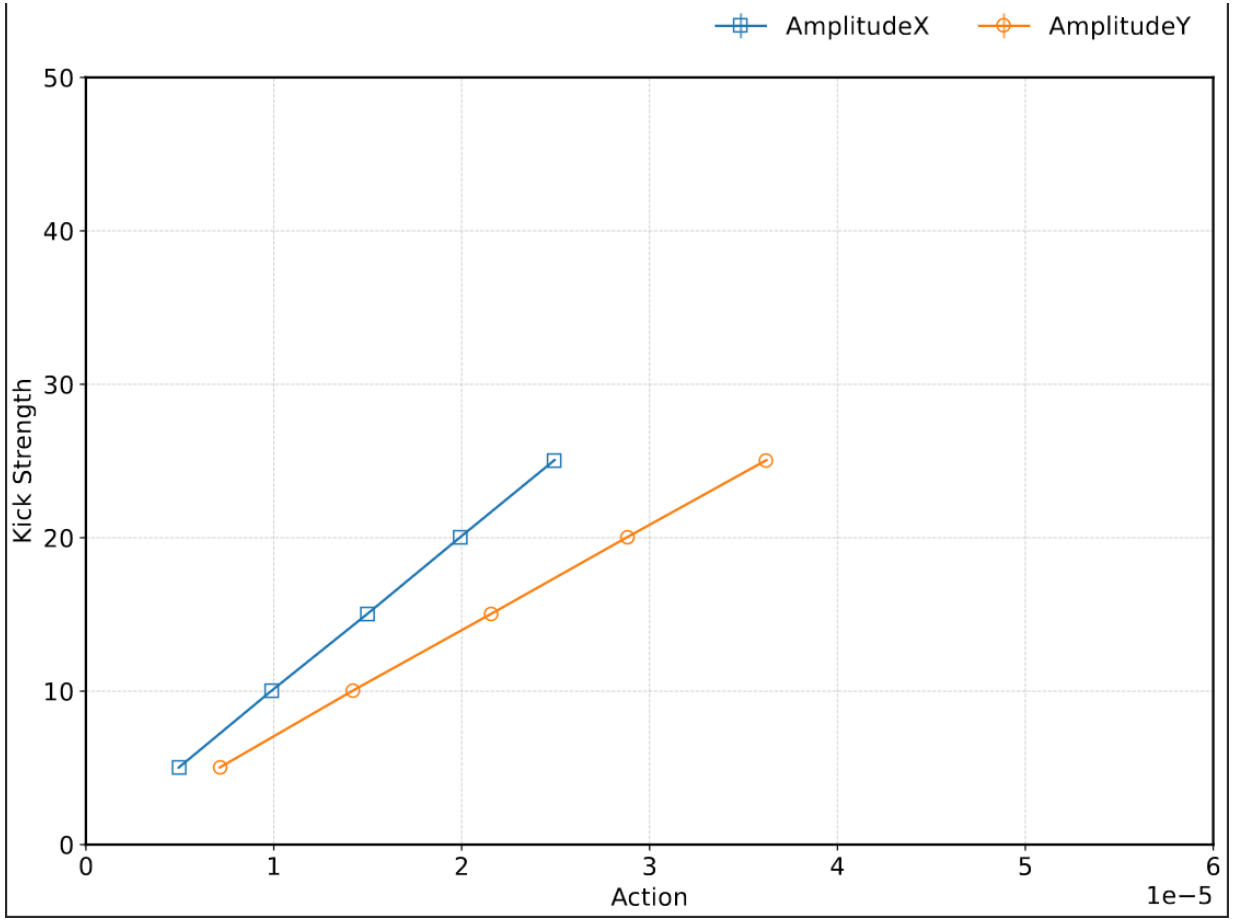

OMC3 vs BBSrc
Beta - BetaMDL)/BetaMDL
0.15
0.10
0.05
0.00
−0.05
−0.10
−0.15
−0.20
0
5000
10000
15000
20000
25000
S

42_Y


OMC3 vs BBSrc
Beta - BetaMDL)/BetaMDL
0.05
0.00
−0.05
−0.10
−0.15
0
5000
10000
15000
20000
25000
S

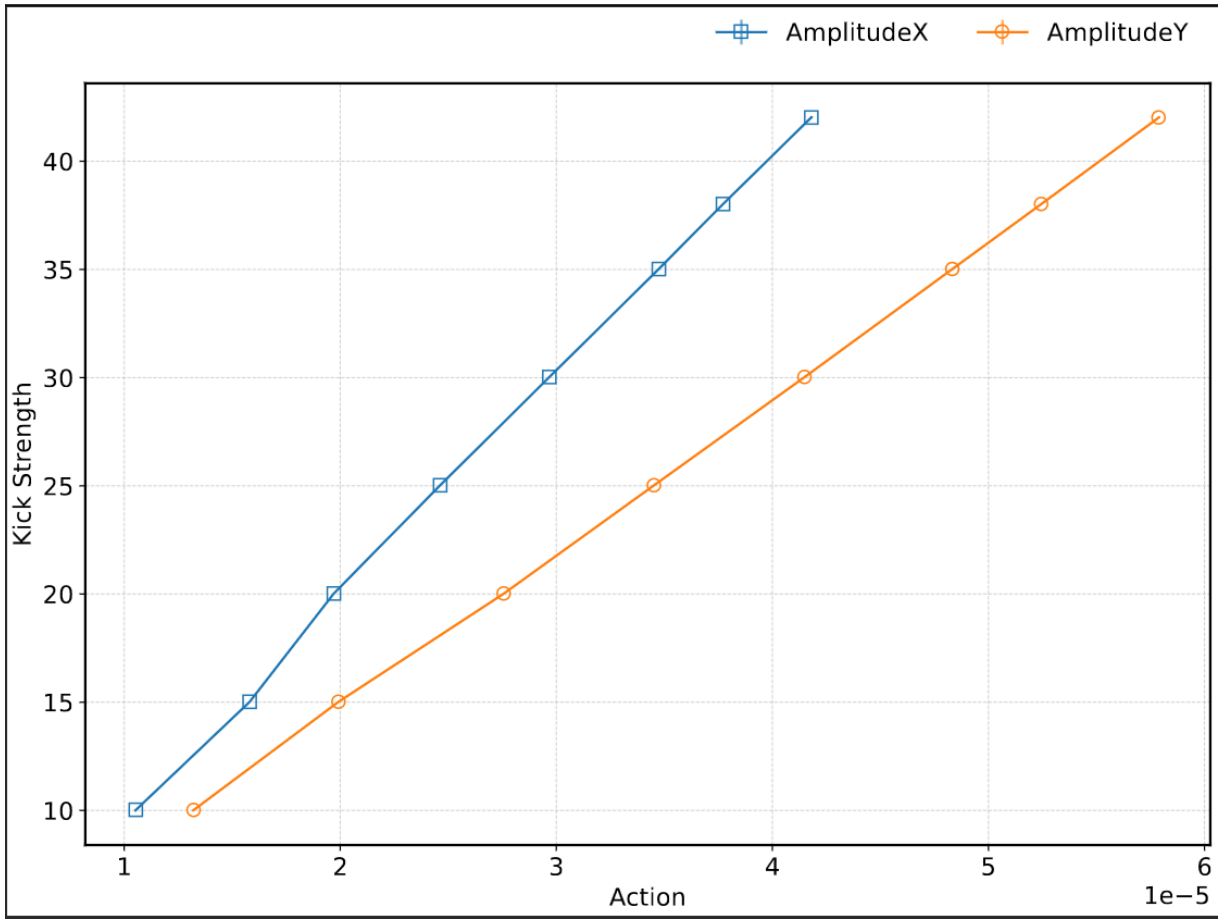
Amplitude Vs Action

Observations:



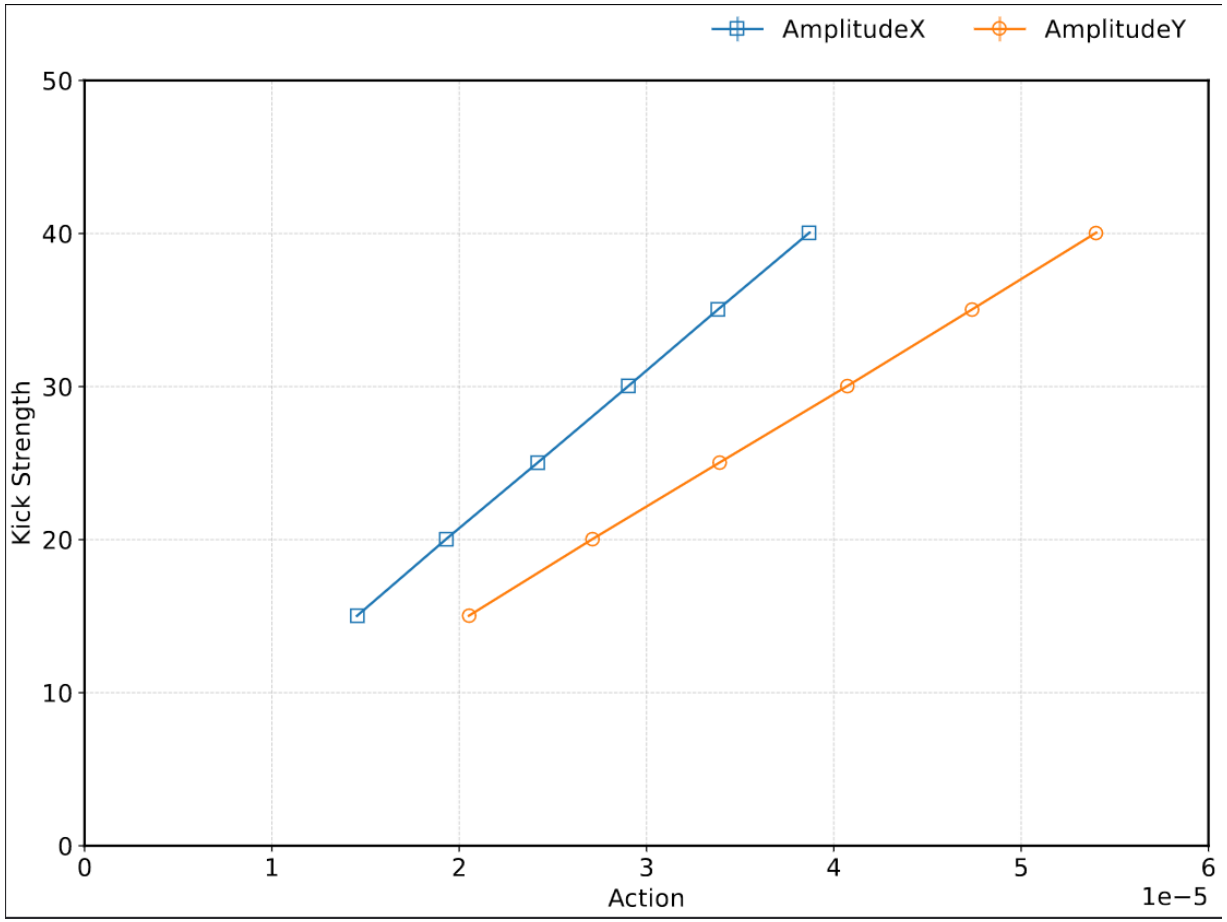
Fill 8521– Beam1 - 30cm

Observations:



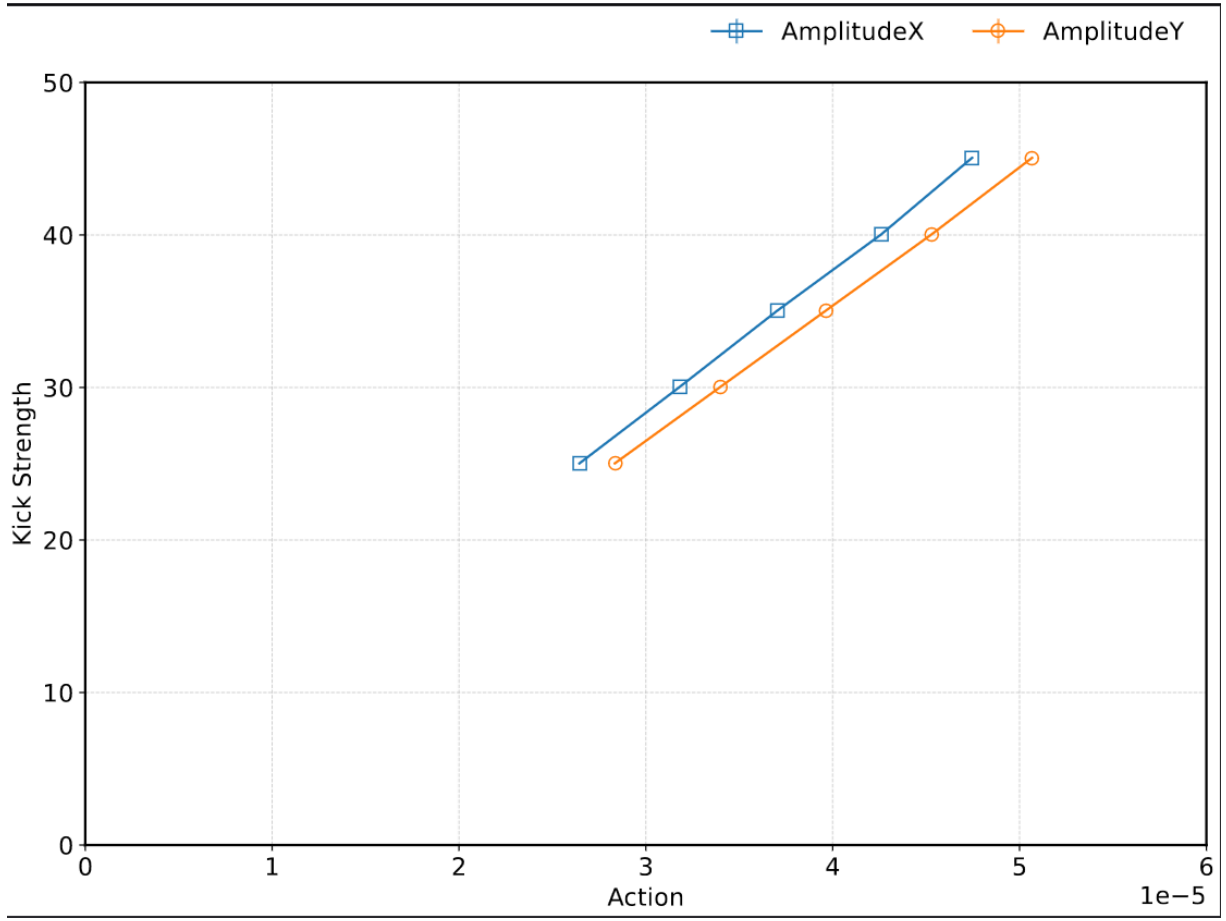
Fill 8521 – Beam1 - 60cm

Observations:



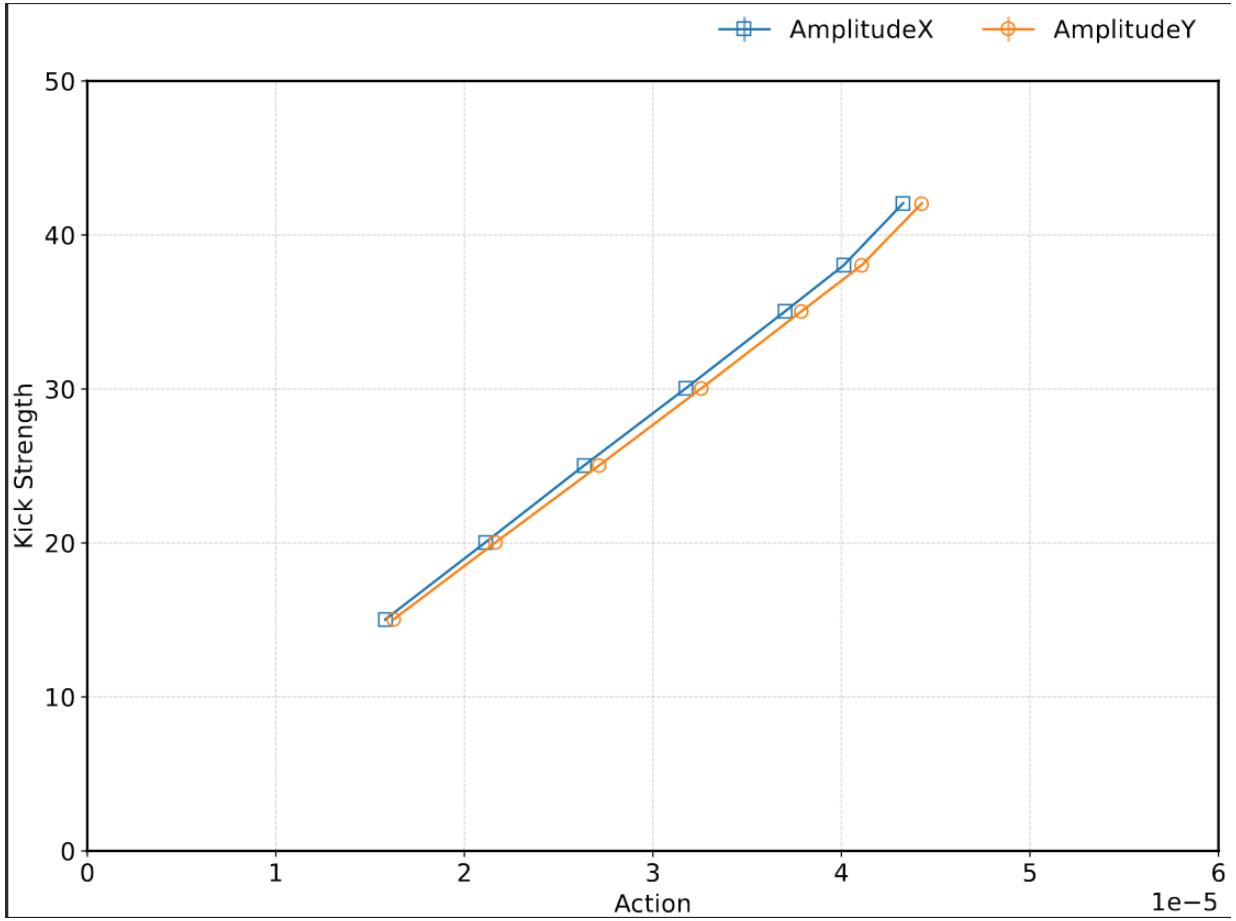
Fill 8521– Beam1 - 120cm

Observations:



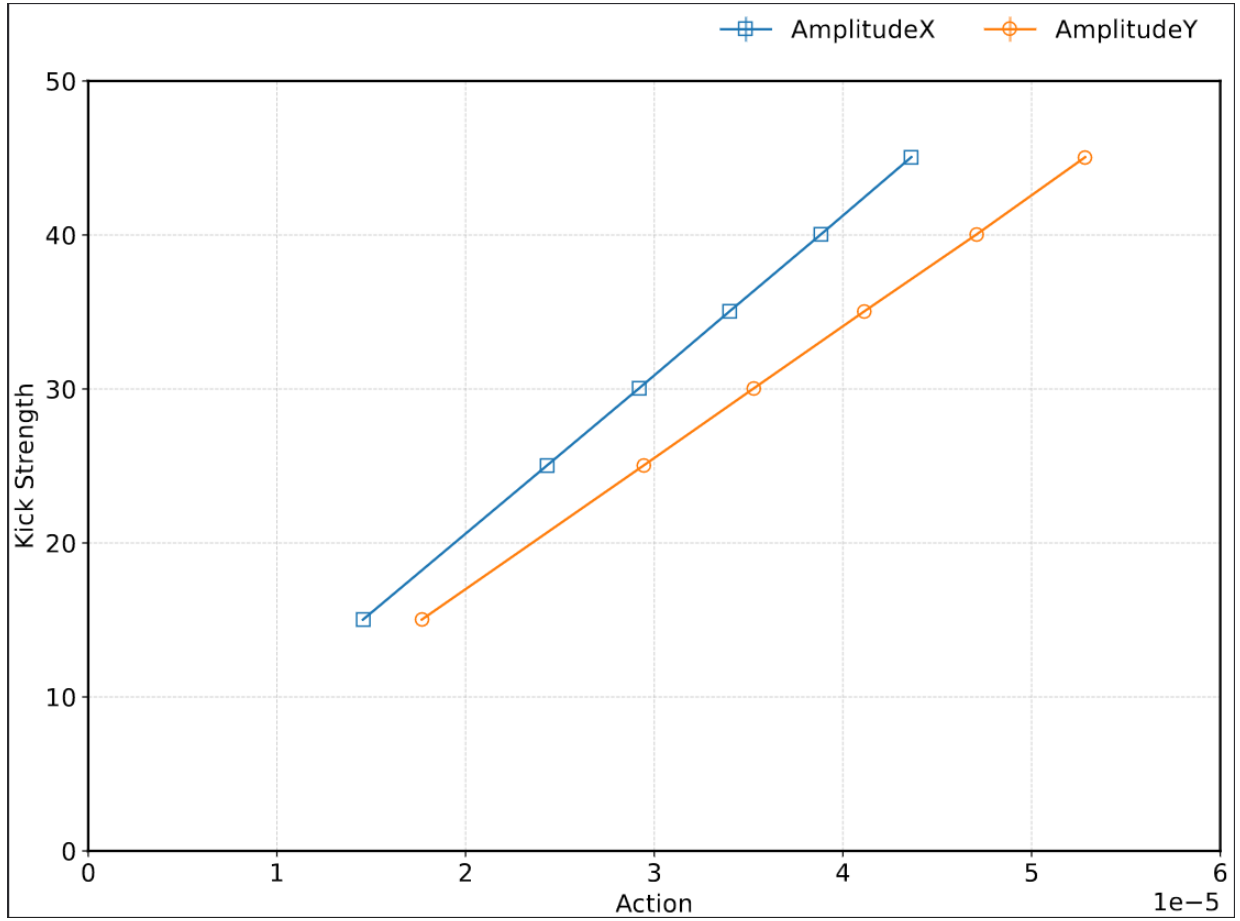
Fill 8521– Beam2 - 30cm

Observations:



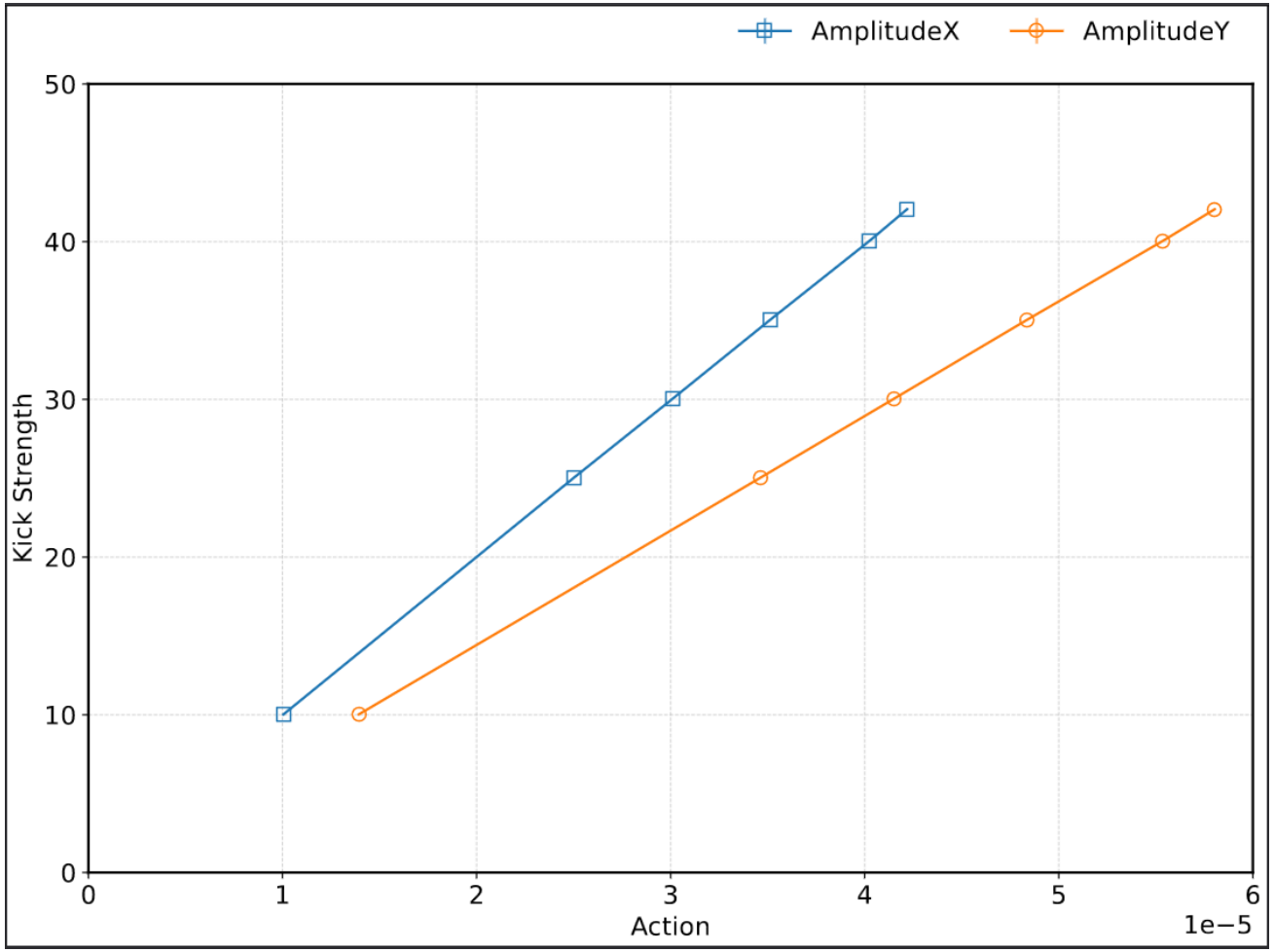
Fill 9403– Beam2 - 60cm

Observations:



Fill 8521– Beam2 - 120cm

Observations:



Fill 9403– Beam1 - 30cm