Shadowing of SMH16 by the dummy septum

Dummy septum meeting on 02/08/2012

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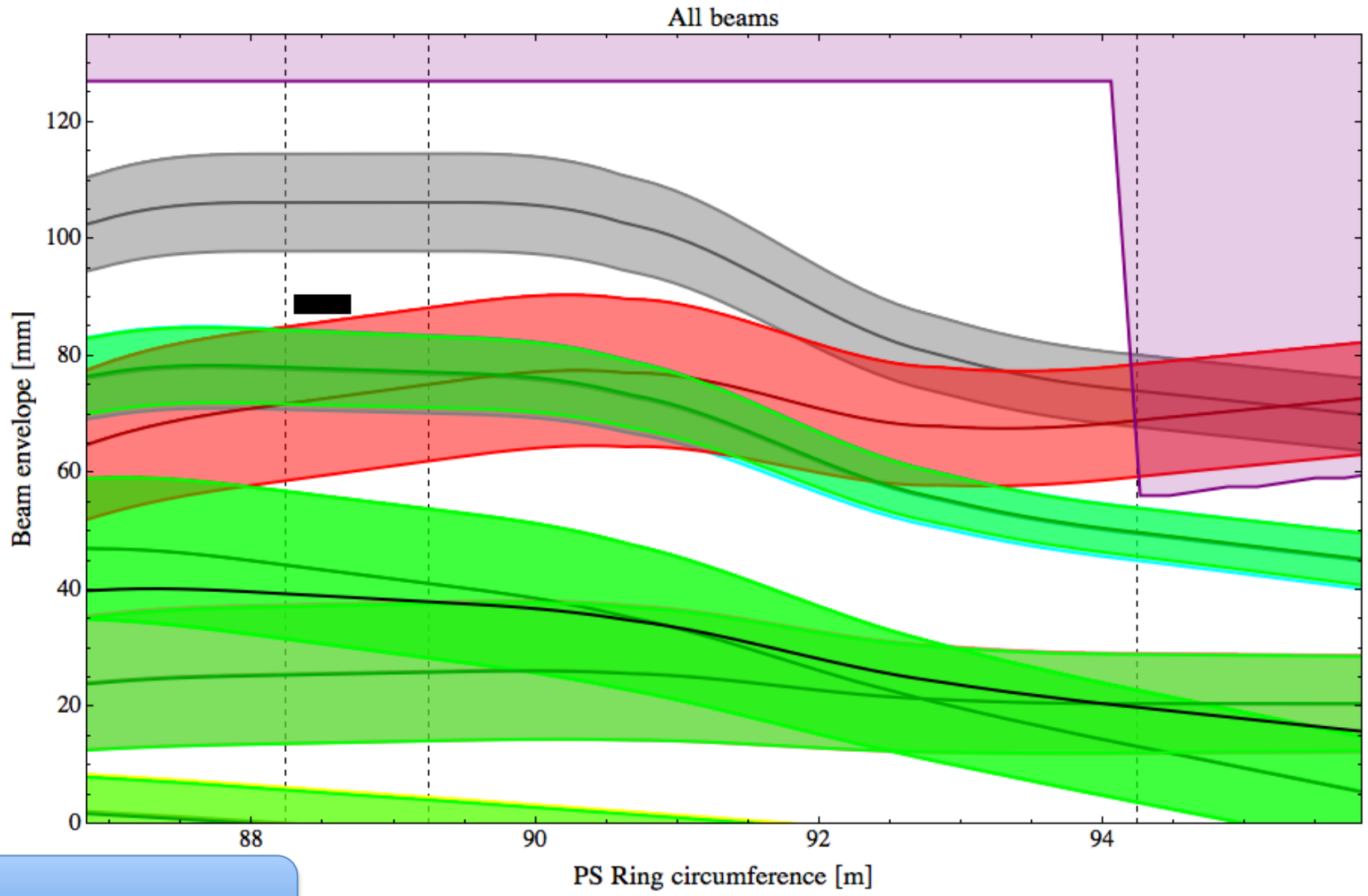
Acknowledgments: M. Giovannozzi

Overview

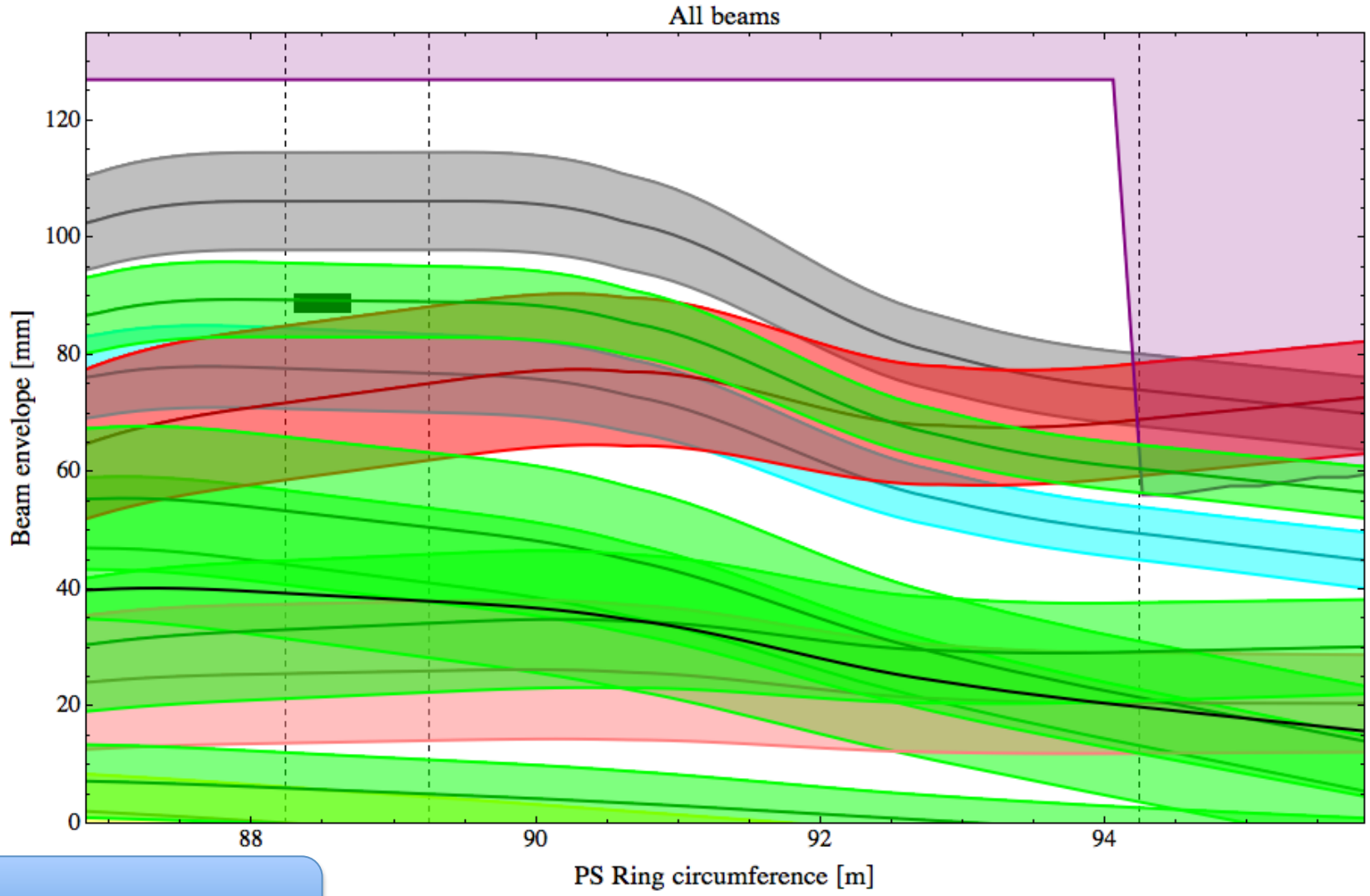
1. Review the "geometry" in SS15 and SS16 as imposed by the beams during the rise time of the kickers
2. Shadowing of SMH16 by the dummy septum during the rise time of the kickers

Rise of the fast bump



0 % Max. strength

Rise of the fast bump



35 % Max. strength

Shadowing

- Particles interact with the dummy septum at a given X position
- The angle, X', is given by*

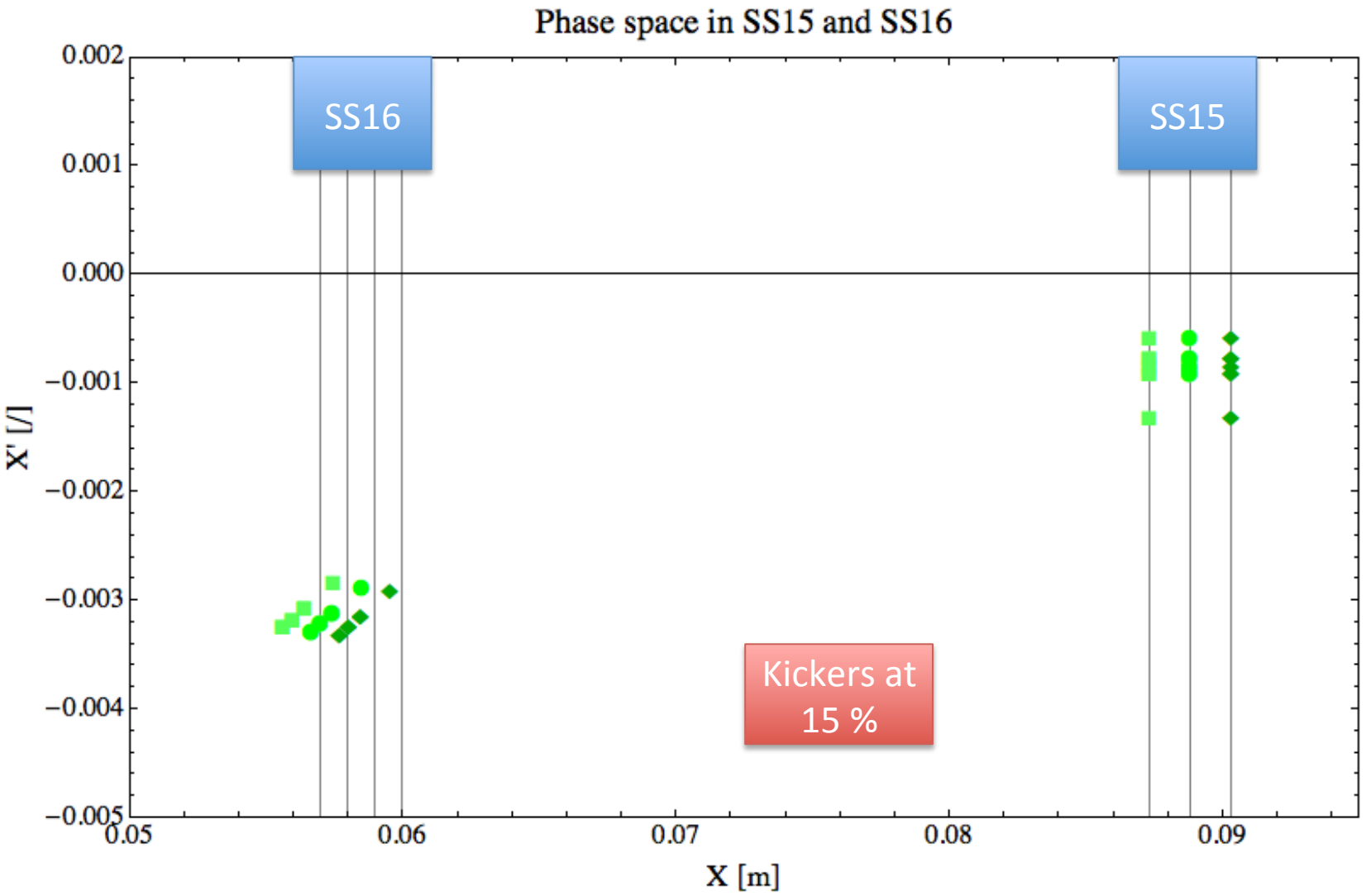
$$X' = X'_{C0} \pm \Delta X'$$

$$\Delta X' = \sqrt{\gamma \epsilon}$$

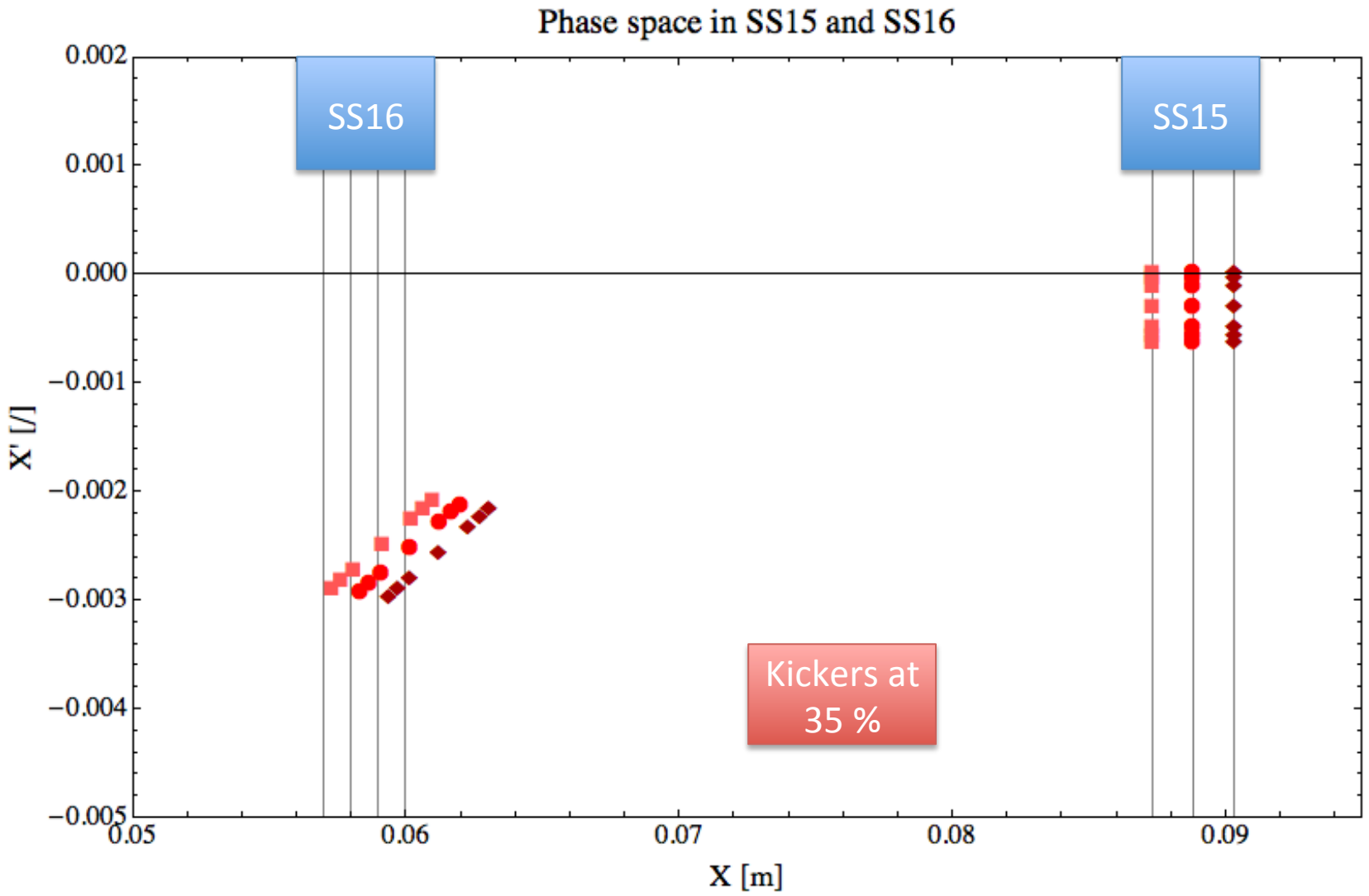
- Interaction with the dummy septum starts at 15 % of the kickers strengths, ends at 60 %
  - We consider the angular spread for 15%, 35%, and 60%

* Chromatic effects not considered here, orders of magnitude smaller, as $\delta = 3 \times 10^{-4}$

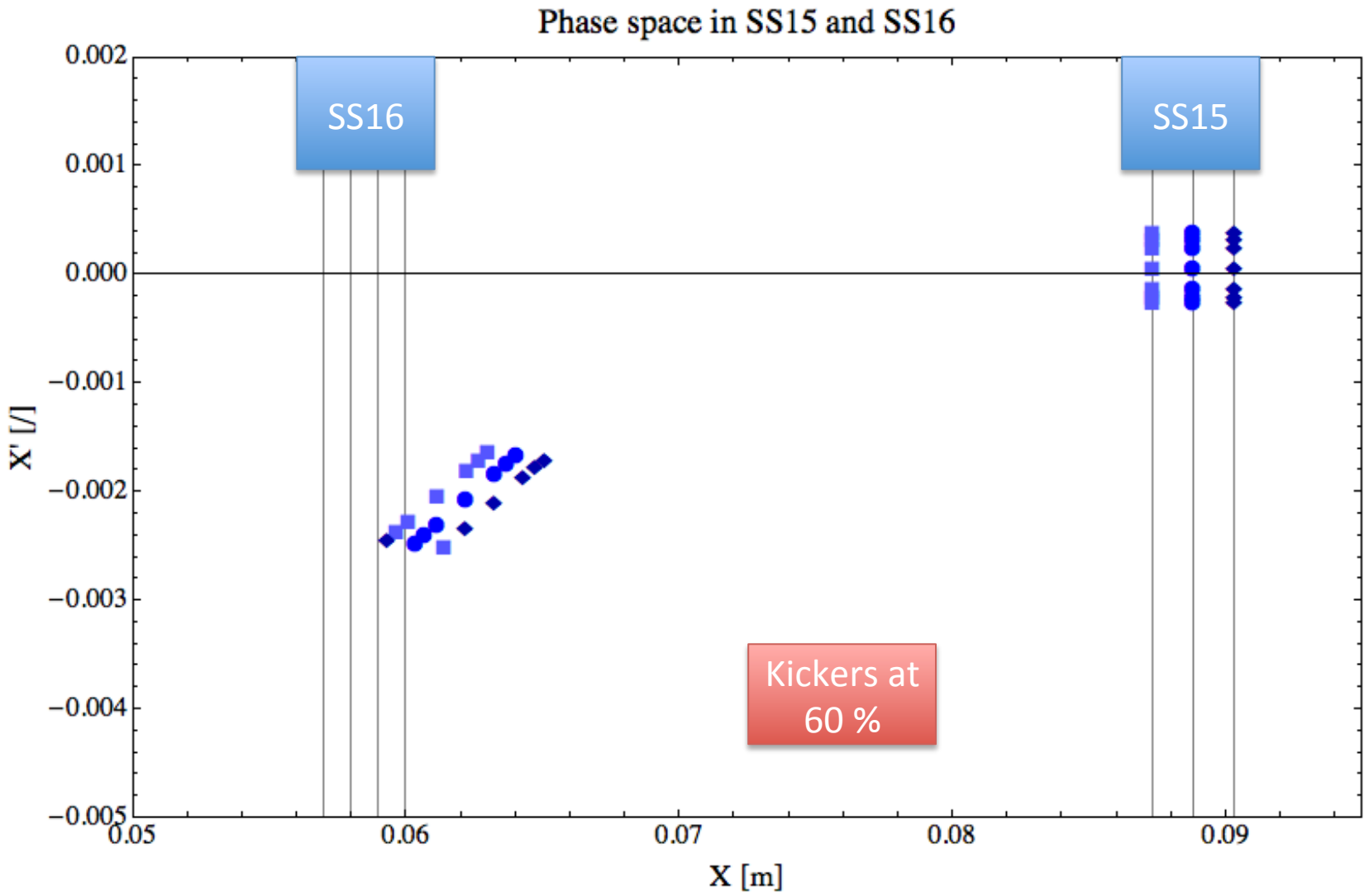
Shadowing


Phase space in SS15 and SS16
SS16
SS15
Kickers at 15 %
X' [/]
X [m]
0.002
0.001
0.000
−0.001
−0.002
−0.003
−0.004
−0.005
0.05
0.06
0.07
0.08
0.09

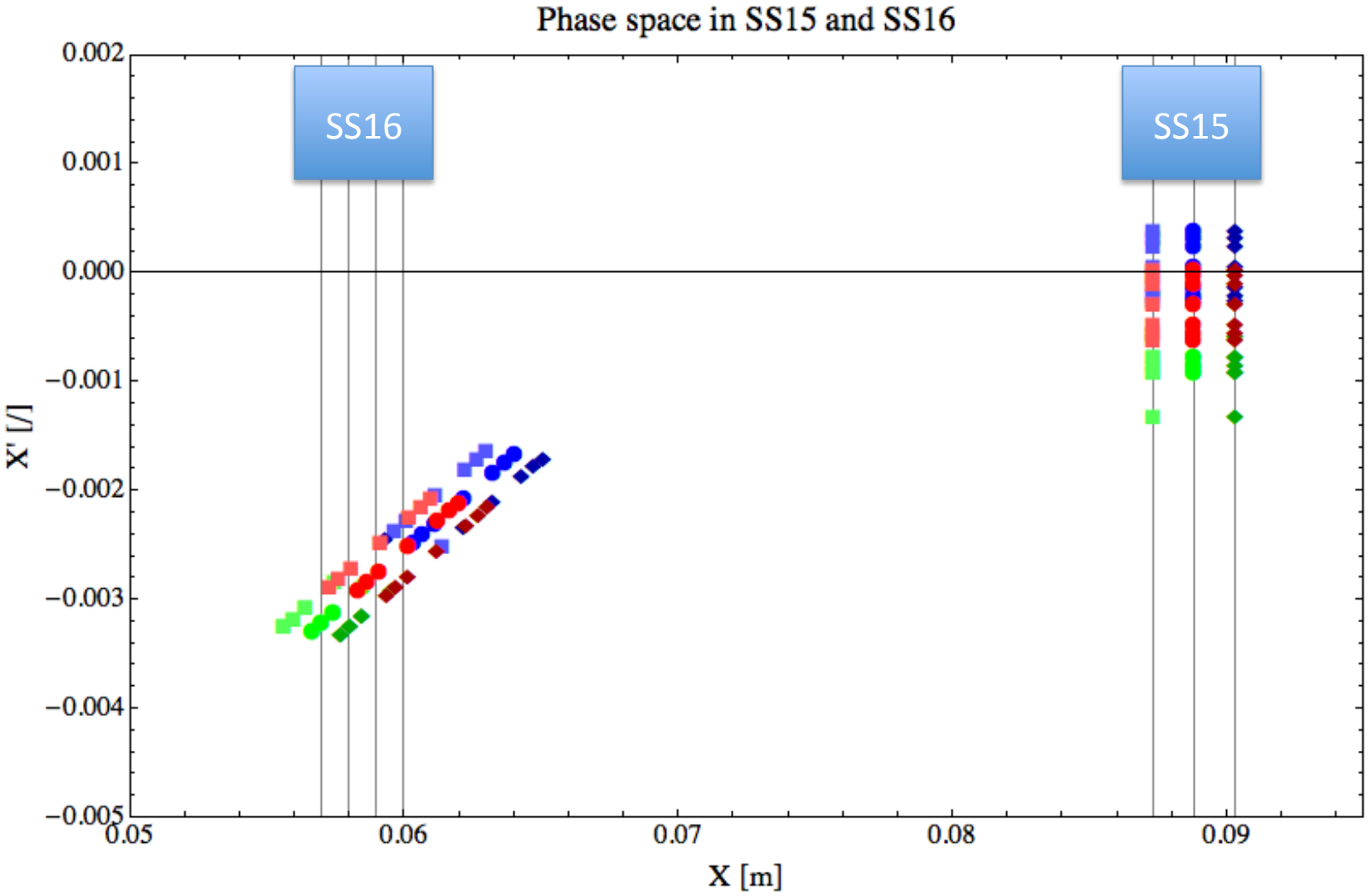
Shadowing


Phase space in SS15 and SS16
SS16
SS15
Kickers at 35 %
X' [/]
X [m]
0.002
0.001
0.000
−0.001
−0.002
−0.003
−0.004
−0.005
0.05
0.06
0.07
0.08
0.09

Shadowing


Phase space in SS15 and SS16
SS16
SS15
Kickers at 60 %
X' [/]
X [m]
0.002
0.001
0.000
−0.001
−0.002
−0.003
−0.004
−0.005
0.05
0.06
0.07
0.08
0.09

Shadowing


Phase space in SS15 and SS16
SS16
SS15
0.002
0.001
0.000
−0.001
−0.002
−0.003
−0.004
−0.005
X' [/]
0.05
0.06
0.07
0.08
0.09
X [m]

Shadowing

- The angular spread in SS15 converted in position spread in is an issue for large amplitude particles (>= 3 sigmas)

OUTER ISLAND	SS15	SS16
Beta [m]	12.4	5.29
Gamma	0.100	0.195

- The angular change during the rise of the kickers seems to be the main problem