

Dynamic Aperture for Lattices With Some $\beta^* = 2$ Insertions

G. Parzen

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Collider Accelerator Department
Brookhaven National Laboratory

U.S. Department of Energy

USDOE Office of Science (SC)

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(1)

The introduction of some $\beta^* = 2$ insertions appears to produce a sudden drop in the dynamic aperture.

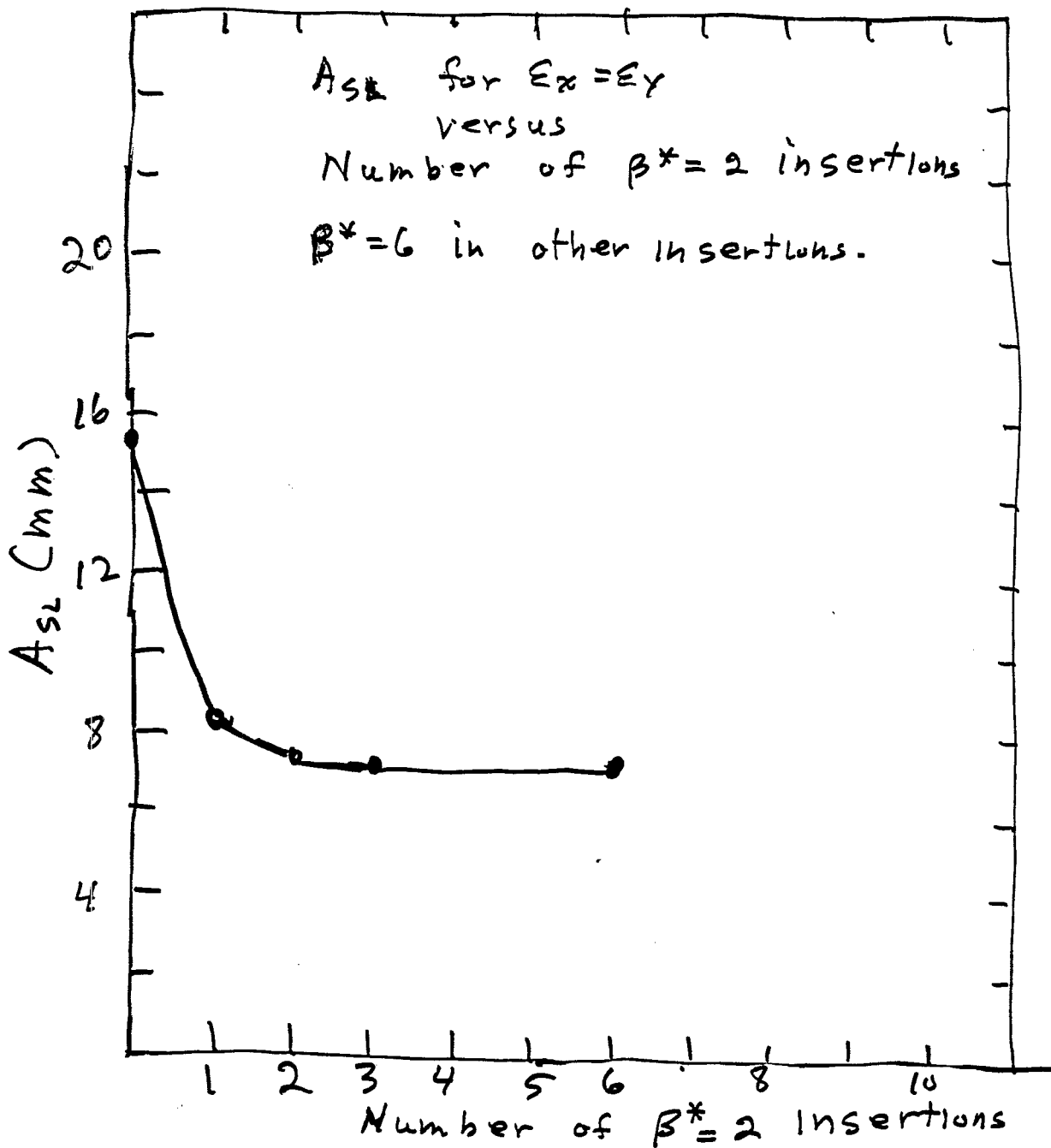
This is in contrast to a previous result (G. Parzen, AD/RHIC-24) for a previous lattice with some $\beta^* = 3$ insertions, where the dynamic aperture decreased almost linearly with the number of $\beta^* = 3$ insertions.

With one $\beta^* = 2$ insertion, A_{SL} for $\epsilon_x = \epsilon_y$ drops from $A_{SL} = 15.5 \text{ mm}$ for 6 $\beta^* = 6$ insertions to $A_{SL} = 8.5 \text{ mm}$ with 1 $\beta^* = 2$ insertion, and to $A_{SL} = 7.5 \text{ mm}$ for 6 $\beta^* = 2$ insertions.

Note that the 6 σ rule requires for A_u $A_{SL} = 10 \text{ mm}$ for 10 hr operation at $\delta = 100 \mu$ when $\epsilon_{x,0} = 60$. Thus even one $\beta^* = 2$ ^{insertion} violates the 6 σ rule here.

For $\epsilon_{x,0} = 10$, $A_{SL} = 7.1 \text{ mm}$ is required for 10 hr operation at $\delta = 100$ for A_u .

The Lattices with some $\beta^* = 2$ insertions were provided by S.Y. Lee.



Possible Interpretation (2/3 rule in BC2)

Assume A_{SL} is determined by BC2 and is given by particle in BC2 reaching 2/3 of RBC2 in any BC2. This gives $A_{SL} = 8.4 \text{ mm}$ for $RBC2 = 4 \text{ cm}$ and $B^* = 2$.

~~For RBC2 = 5 cm~~

For $RBC2 = 5 \text{ cm}$ and $B^* = 3$, this 2/3 rule gives $A_{SL} = 12.5 \text{ mm}$.

2/3 Rule in BC2 Interpretation

