The dynamic aperture is scanned at different tunes. TME-cell is moved from (108?, 36?) to (108?, 45?). and the STR cell is detuned to set the tunes to (24.28, 12.10). Then the TME-cell is detuned to increase the horizontal tune by 1 to have three operating points, (25.16, 10.15), (24.16, 12.15) and (25.16, 12.15). The dynamic aperture is scanned in their neighborhood.

### Three Operation Points

**Point A:** Nu = (25.16, 10.15)

This is the “original” operation point. The TME-cell has 36? vertical tune advance.

**Point B:** Nu = (24.16, 12.15)

This is the “original” operation point. The TME-cell is detune to have 45? vertical tune advance. The str-cell is also detuned to adjust the tunes. PME’s fitting routine was used only for K values.

<table>
<thead>
<tr>
<th>Input</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arc Nux</td>
<td>Arc Nuy</td>
</tr>
<tr>
<td>Old: 0.3000002 0.1019999</td>
<td>0.2619998 0.3000000</td>
</tr>
<tr>
<td>New: 0.2985000 0.1250000</td>
<td>0.2500000 0.2530000</td>
</tr>
</tbody>
</table>

**Point C:** Nu = (25.16, 12.15)

Two quadrupole families of the TME-cell are used to shift the horizontal tune from B.
Point A: \( \text{Nu} = (25.16, 10.15) \)

This is the original point. Beta function fitting is quite perfect.
Point B: \( \text{Nu} = (24.16, 12.15) \)

TME cell \( \text{dNuy} = 45 \text{ deg/cell} \). Beta function are fit flat but the transition parts are not massaged.
Point C: \( \text{Nu} = (25.16, 12.15) \)

Simply detuned from Point C.
Dynamic Aperture Scan around Point A  \( N_{ux} = 25.10 \text{ to } 25.22, N_{uy} = 10.10 \text{ to } 10.20 \)
\( X = -1.0 \text{ to } 1.0 \text{ mm}, Y = -2.0 \text{ to } 2.0 \text{ mm} \).

This is what we reported in the previous note of March 30, 2000.
Dynamic Aperture Scan around Point B  \( N_{ux}=24.10 \text{ to } 24.22, N_{uy}=12.10 \text{ to } 12.20 \)
\[ X = -1.0 \text{ to } 1.0 \text{ mm}, Y = -5.0 \text{ to } 5.0 \text{ mm}. \]
Dynamic Aperture Scan around Point C  \( N_{ux} = 25.10 \) to 25.22, \( N_{uy} = 12.10 \) to 12.20  
\( X = -2.5 \) to 2.5 mm, \( Y = -5.0 \) to 5.0 mm
Conclusion:

Sticking to the PME’s original lattice, we moved the working point and started seeing larger dynamic aperture.

The original working region A provides the dynamic aperture of $X \sim 0.5$ mm and $Y \sim 1.5$ mm for the best case. The new region B enhanced it to $X > 2.0$ mm and $Y \sim 3.0$ mm at some tunes. This is a very interesting region and we are now scanning much wider area of $N_{ux}=24.05$ to 24.45 and $N_{uy}=12.05$ to 12.45, which will take a day to calculate. (It requires 1681 sets of tracking of 1681 points, 400 turns max) We report the result in the next note. On the other hand, the region C is already showing the limit. Therefore, we put more weight on B.

Anyway, the PME’s lattice holds lots of possibilities and we are digging a few of them.