17TH ADVANCED BEAM DYNAMICS WORKSHOP ON
FUTURE LIGHT SOURCES

Scheme to Construct LSS 30m Long into SPring-8 Storage Ring

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"Scheme to Constract LSS 30m Long into SPring-8 Storage Ring"

presented by

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SPring-8

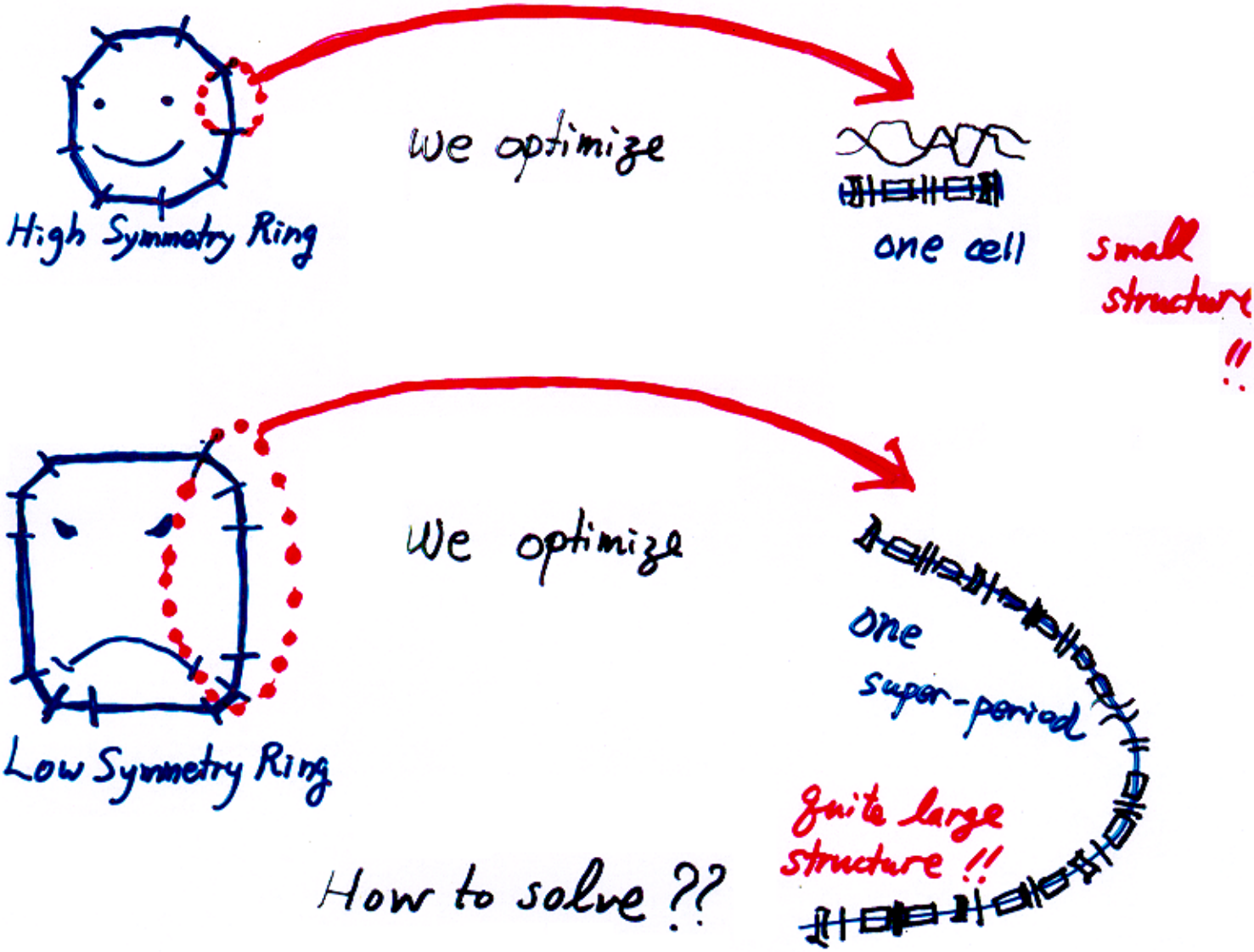
⊙ It is not easy to obtain the dynamic stability for a low symmetry ring with a few LSSs by optimizing strength distribution of sextupoles.

1. Basic Idea

Sextupole Potential → $A(x^3 - 3xy^2)$

$\Downarrow$

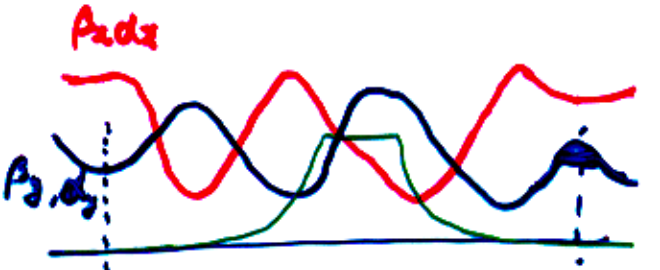
$\phi_x, \phi_y \rightleftharpoons \phi_x \pm 2\pi,\ \phi_y \pm \pi$



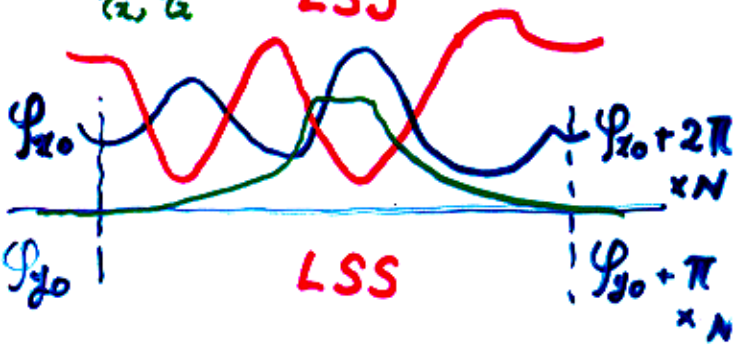
Special Matching Condition

we need to build "Transparent LS".

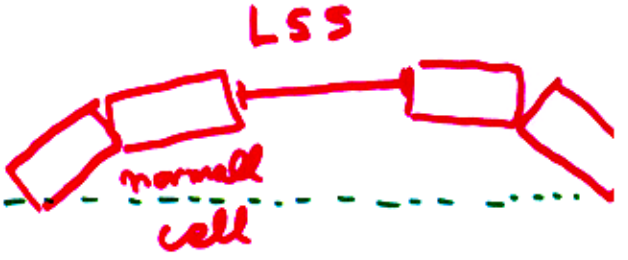
- Optic Matching



- Phase Matching



- No Sextupole in LS



- Localization of error sources

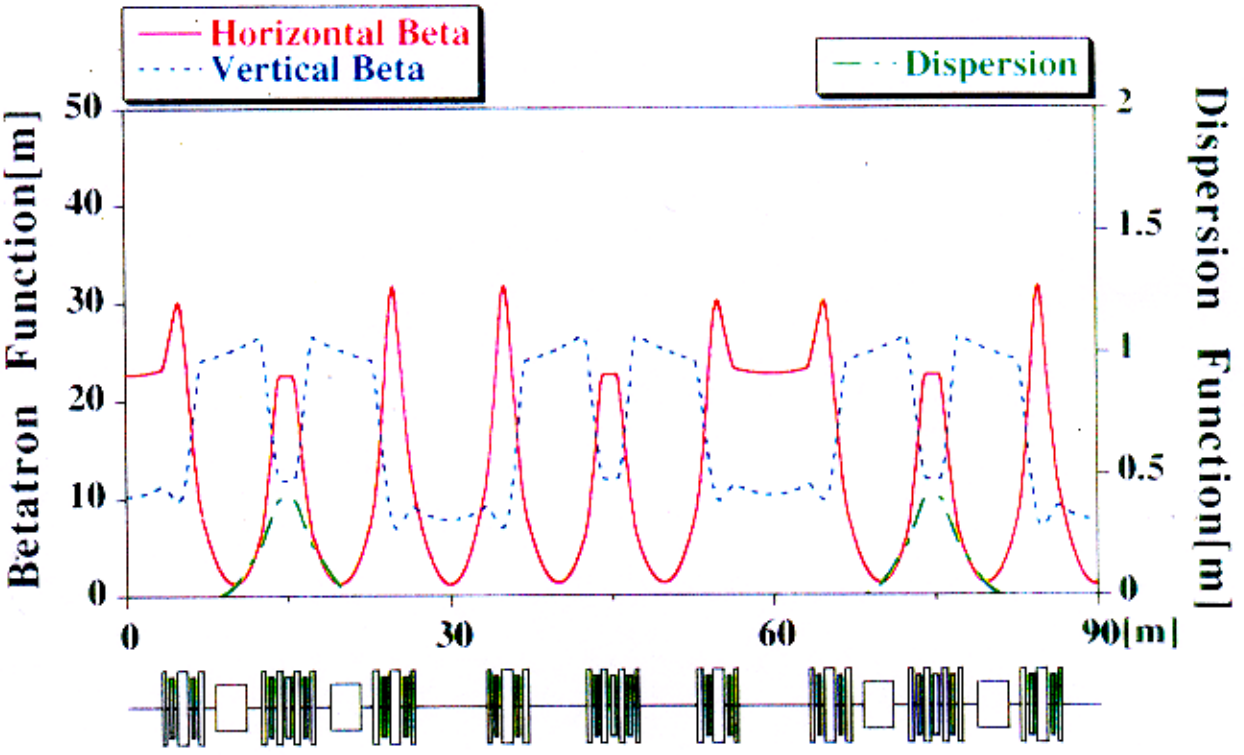
single kick like orbit distortion

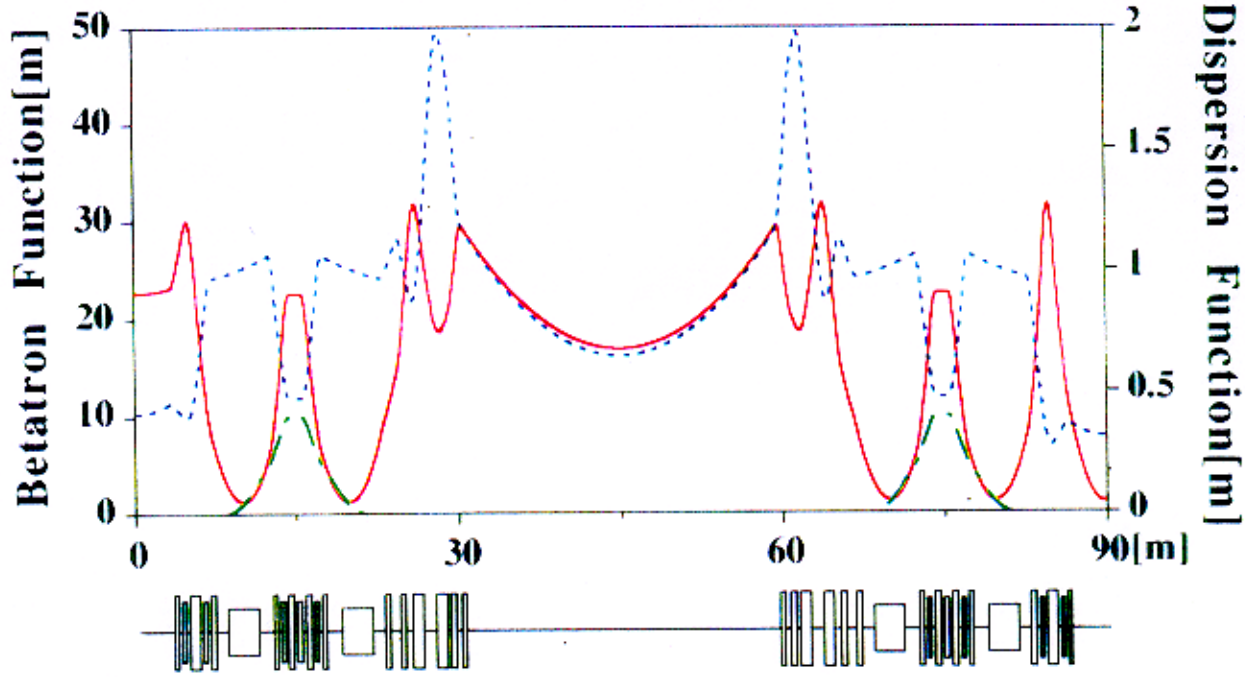
2. SPring-8 Approach

We could not fully understand the matching condition in a design phase,

we took a "multi-stage" approach.

$\Rightarrow$ Missing BM cell


Horizontal Beta
Vertical Beta
Dispersion
Betatron Function[m]
Dispersion Function[m]
0
10
20
30
40
50
0
0.5
1
1.5
2
0
30
60
90[m]


Betatron Function[m]
Dispersion Function[m]
0
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90[m]