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Dynamic aperture scan in tune space

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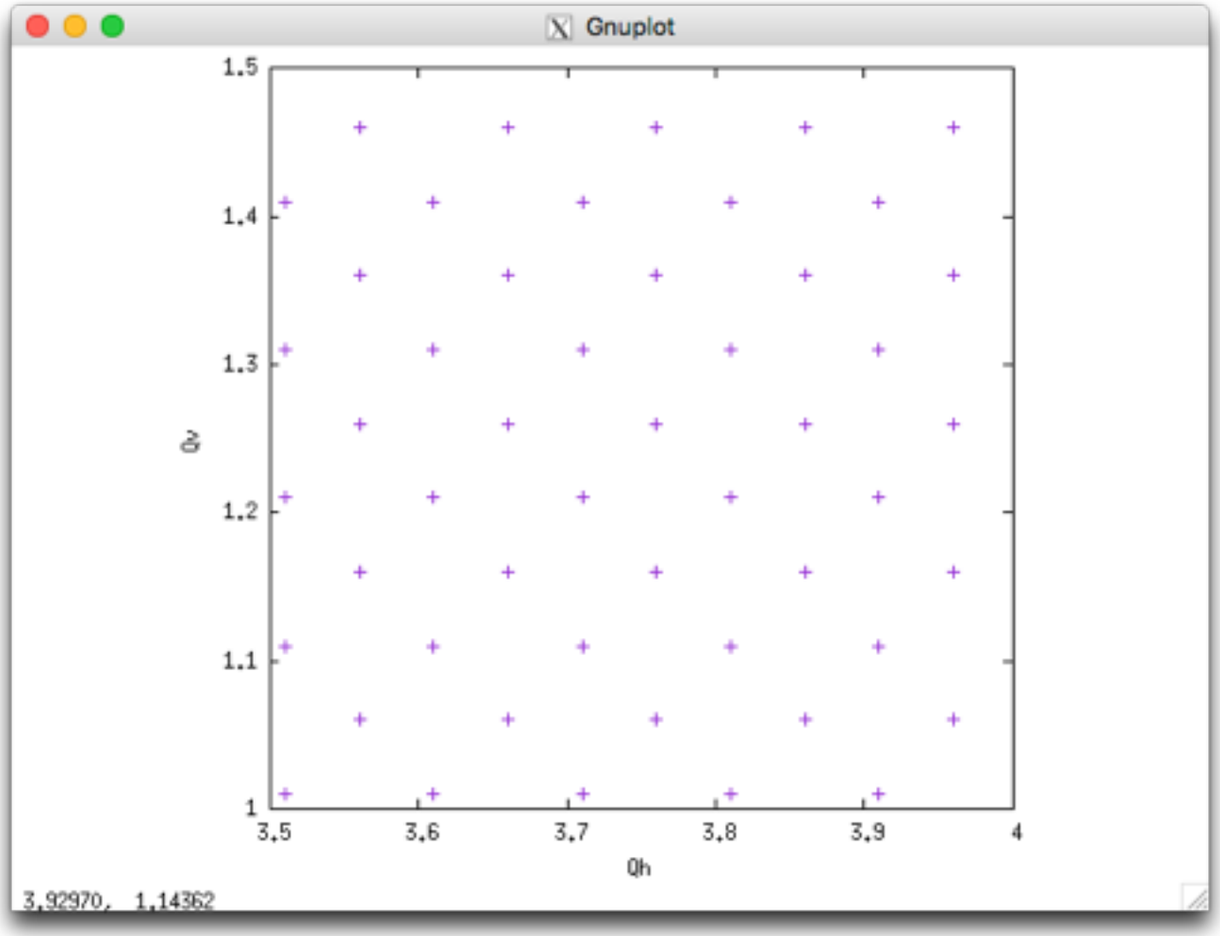
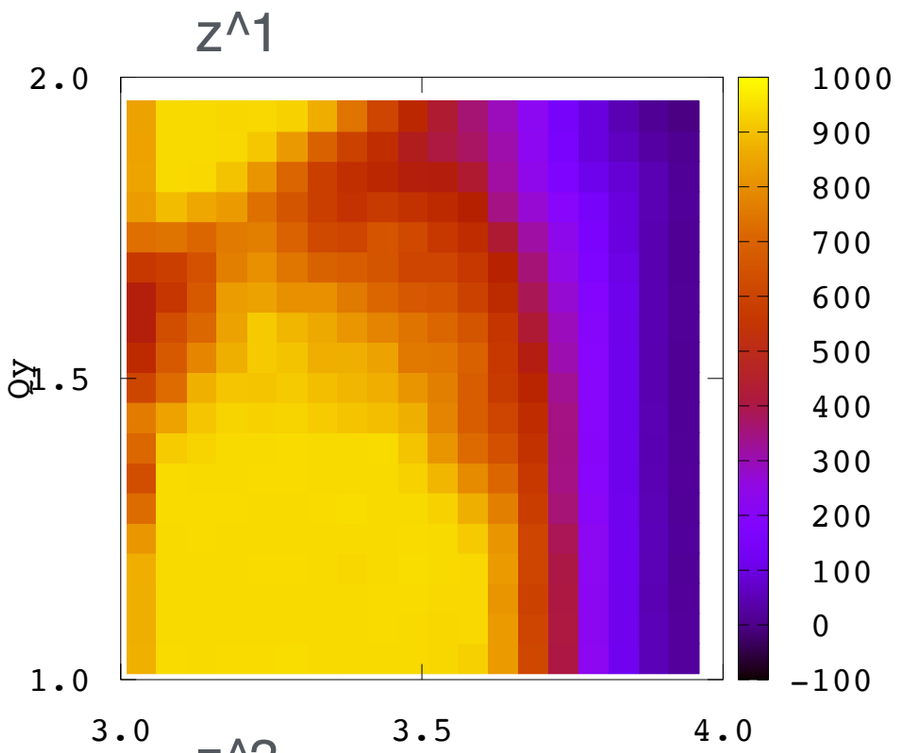
DA definition

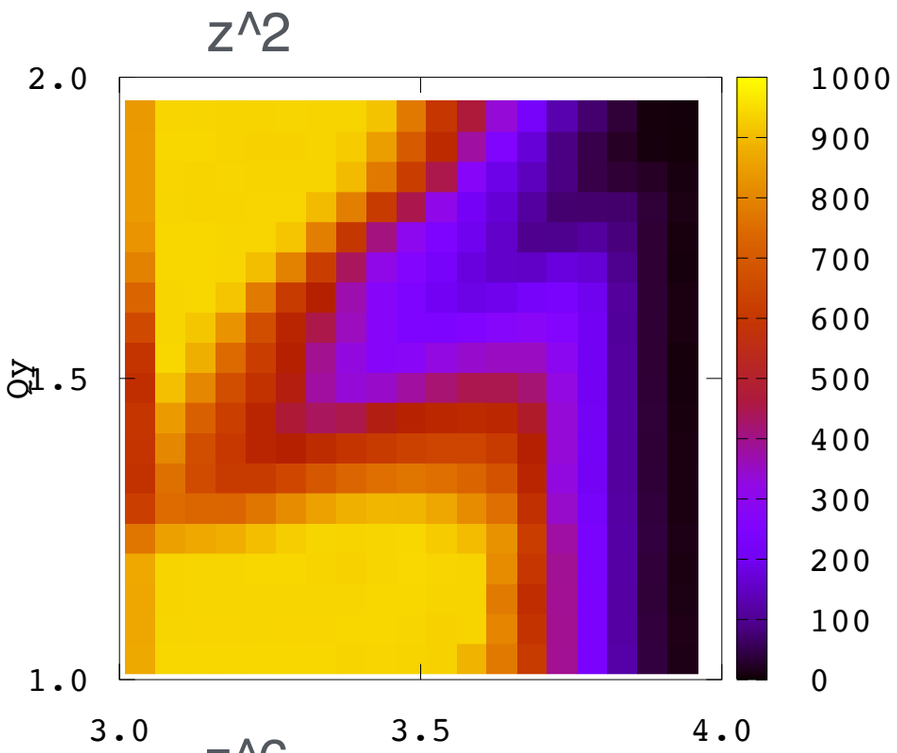
- Use hardedge FFAG
- Survival of 1000 turns
- Vertical amplitude is fixed
  - 1 pi mm mrad
- At 11 MeV
- Scan at grid points



Tune scan results

DA (pi mm mrad, normalised) with different order in vertical direction.





As expected,

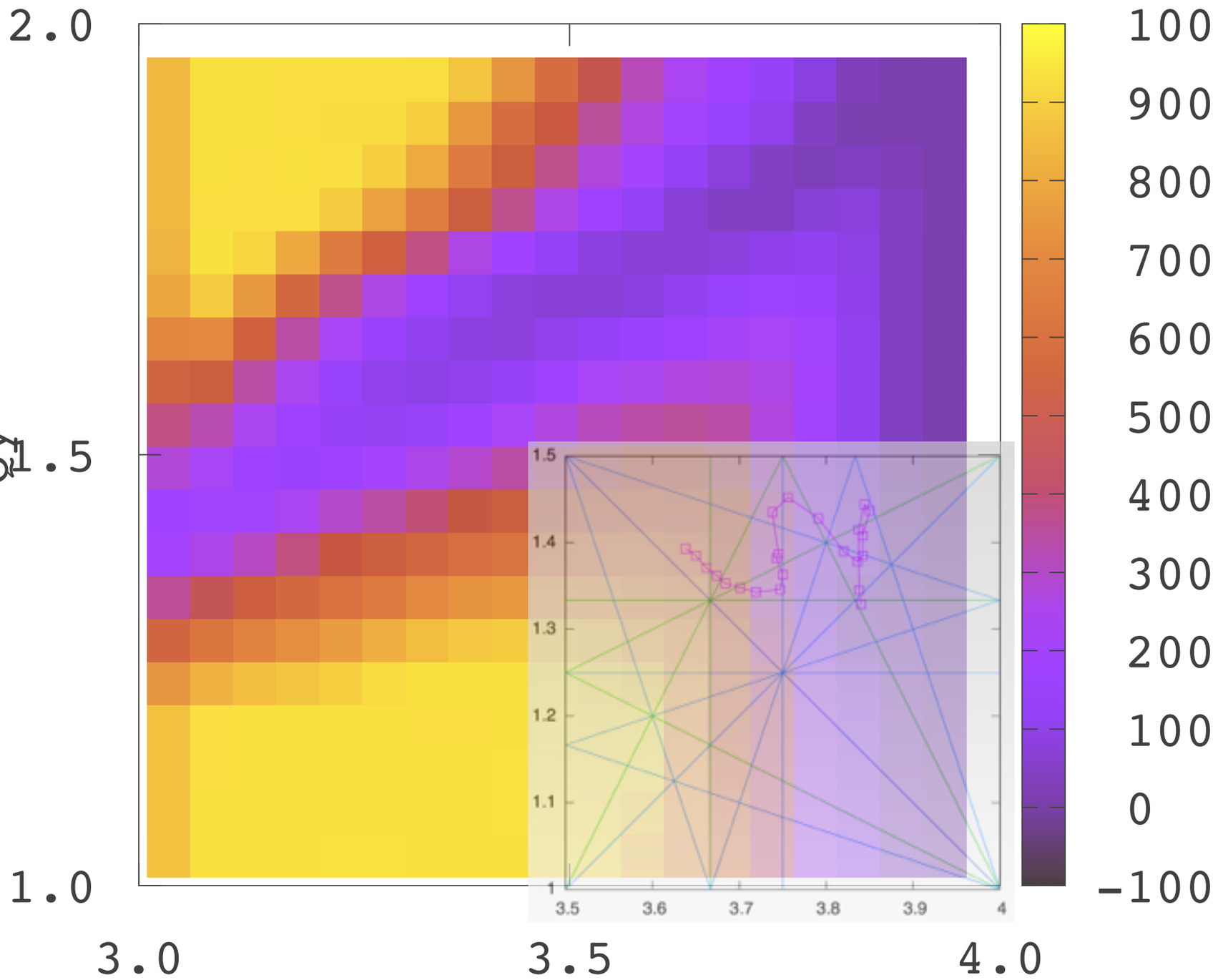
3Qx=12

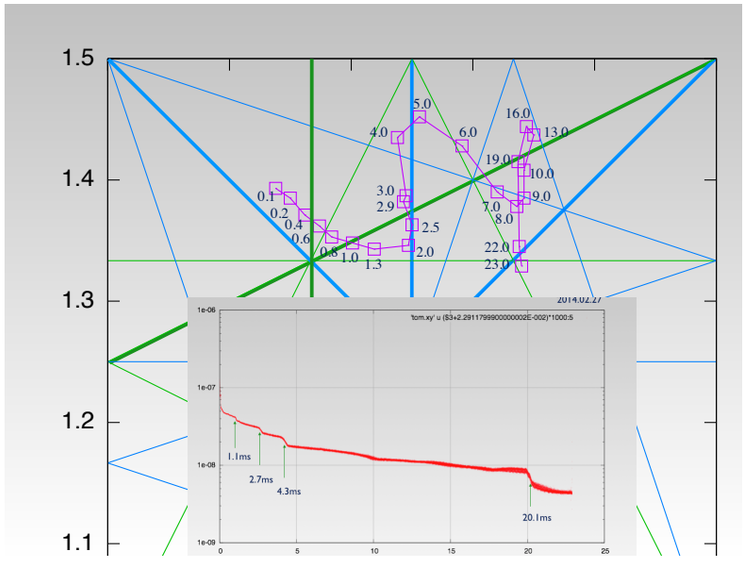
Qx-2Qy=0

reduce DA.

Order of z has to be more than 2.

Tune excursion and DA





Gradual loss during acceleration can be explained as the reduction of DA.

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Summary

- Third order systematic resonance is very strong.
- Unfortunately, operational tune migrates to resonance region gradually as the beam is accelerated. That may be a reason of the slow beam loss.
- Can we demonstrate large DA at lower tune if we can change horizontal tune (only) at injection?