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Dynamic aperture vs tune

Shinji Machida
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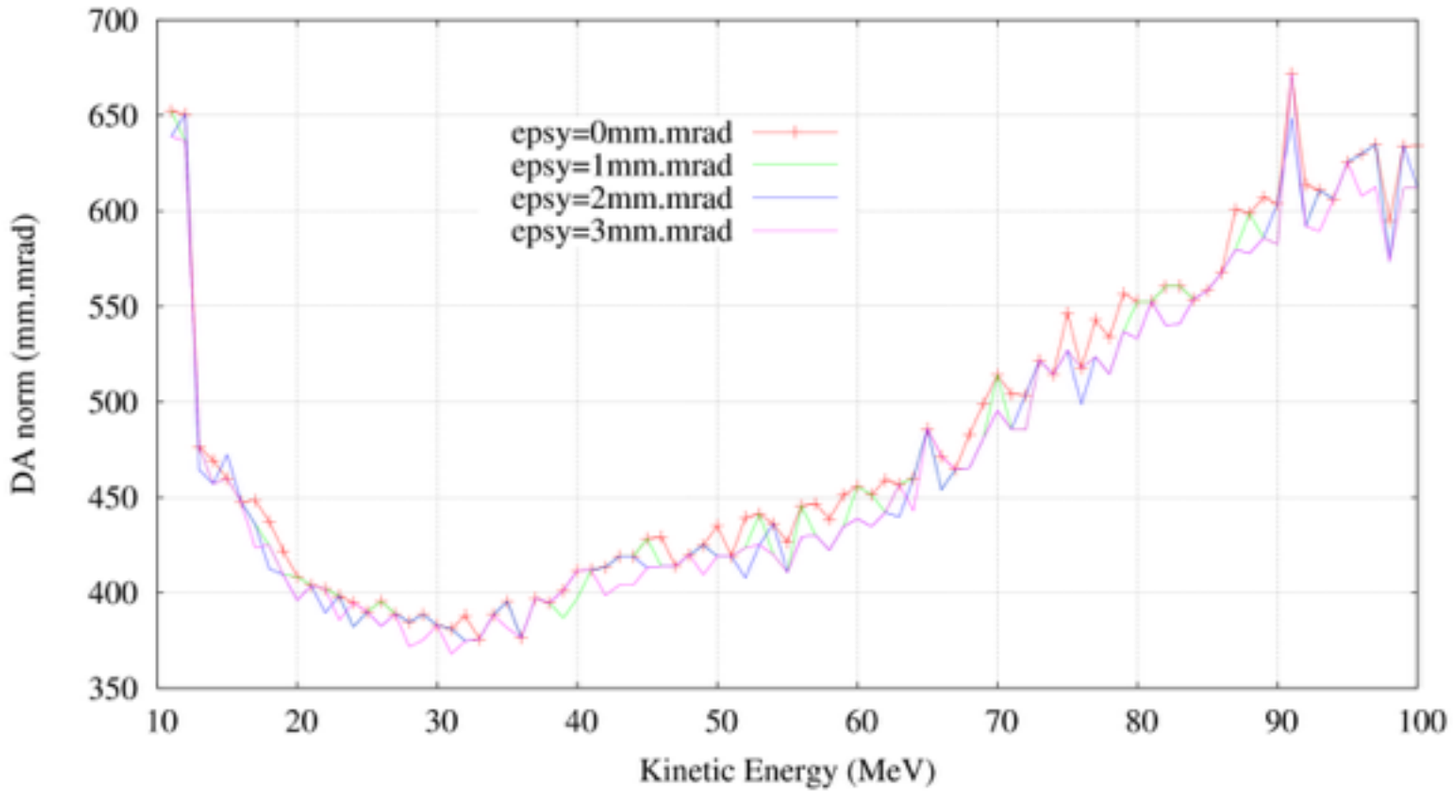
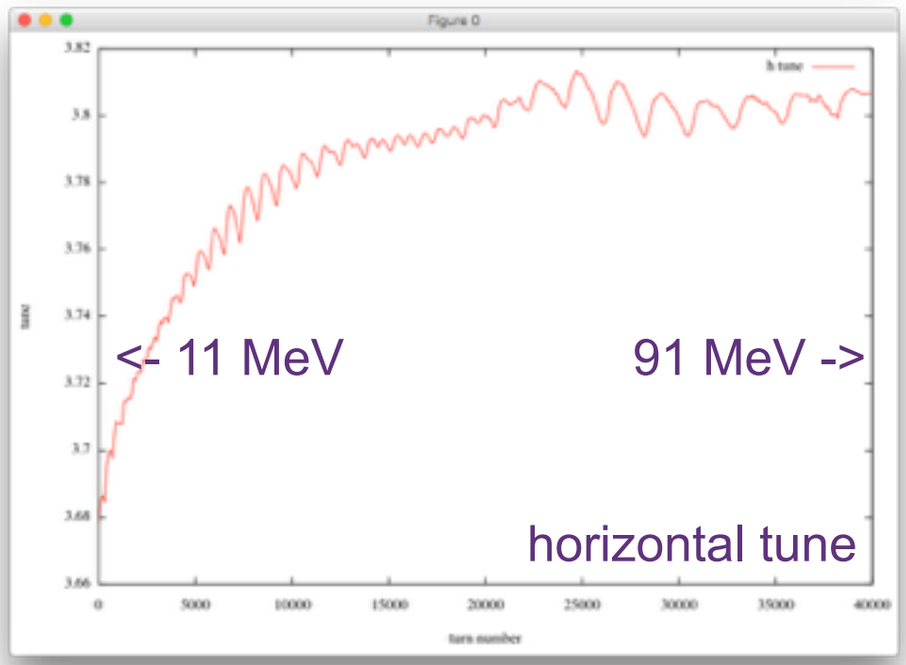
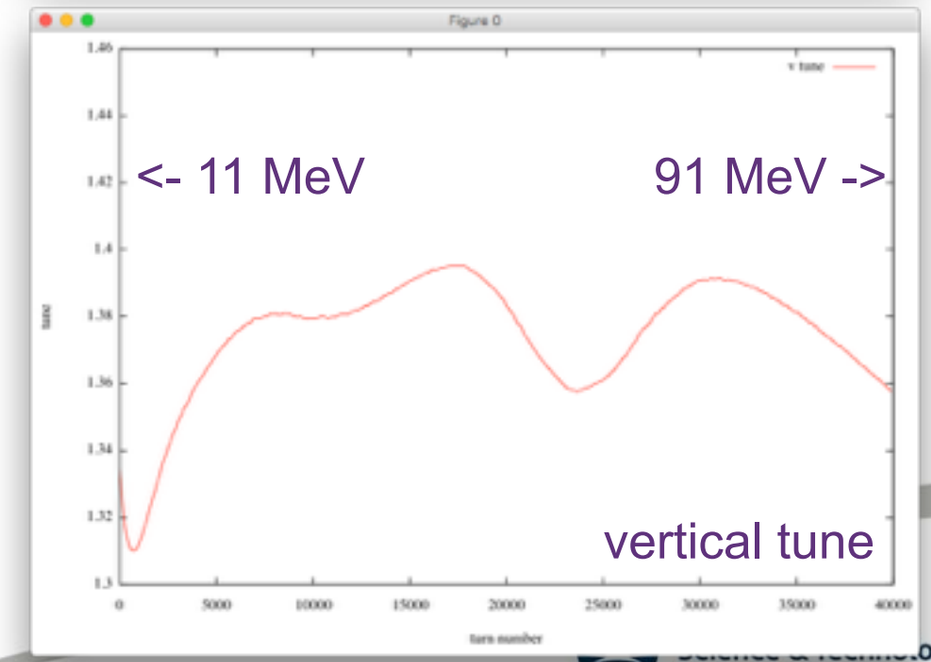
Background

- Malek showed a results of dynamic aperture (DA) vs kinetic energy.
- Is there correlation between DA and tune?

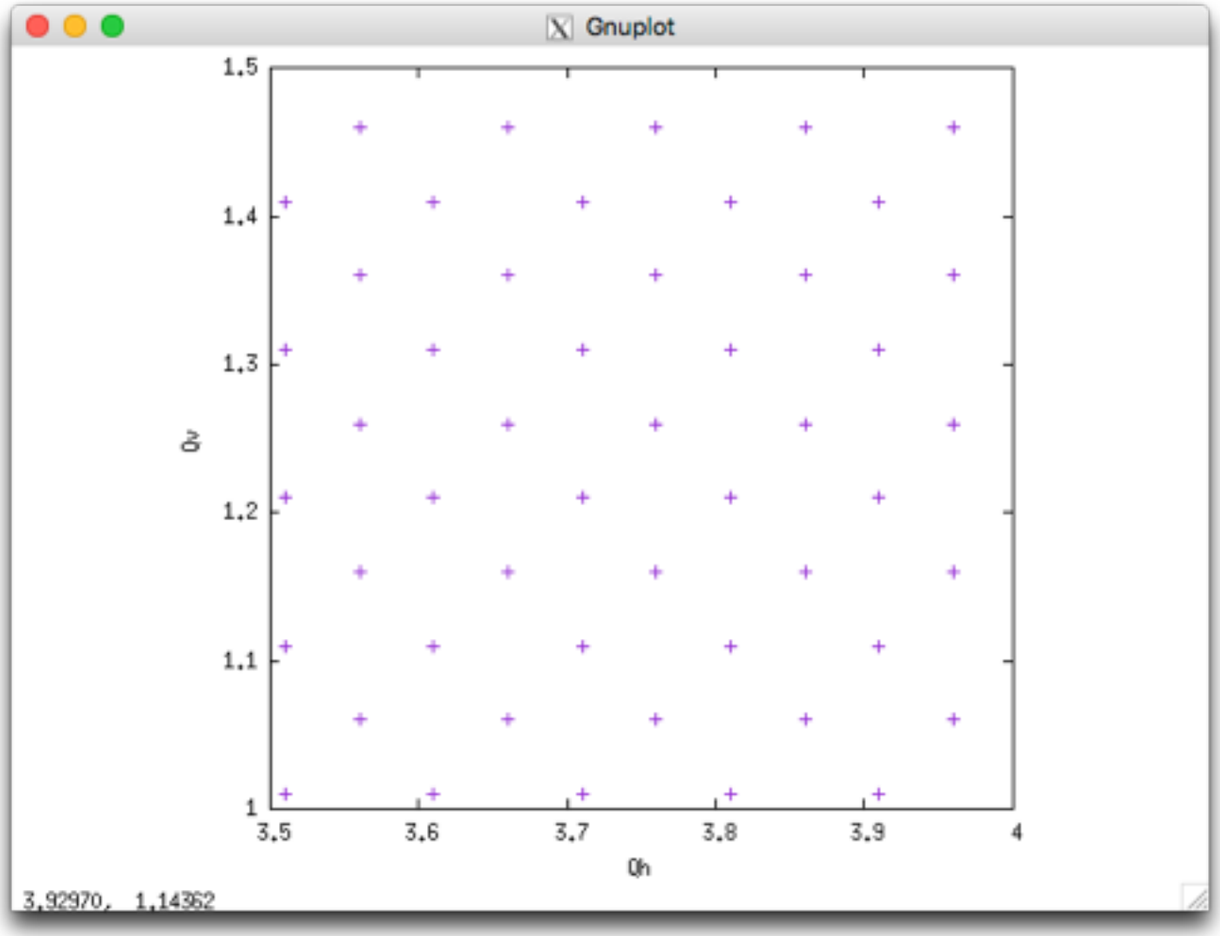






DA definition

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



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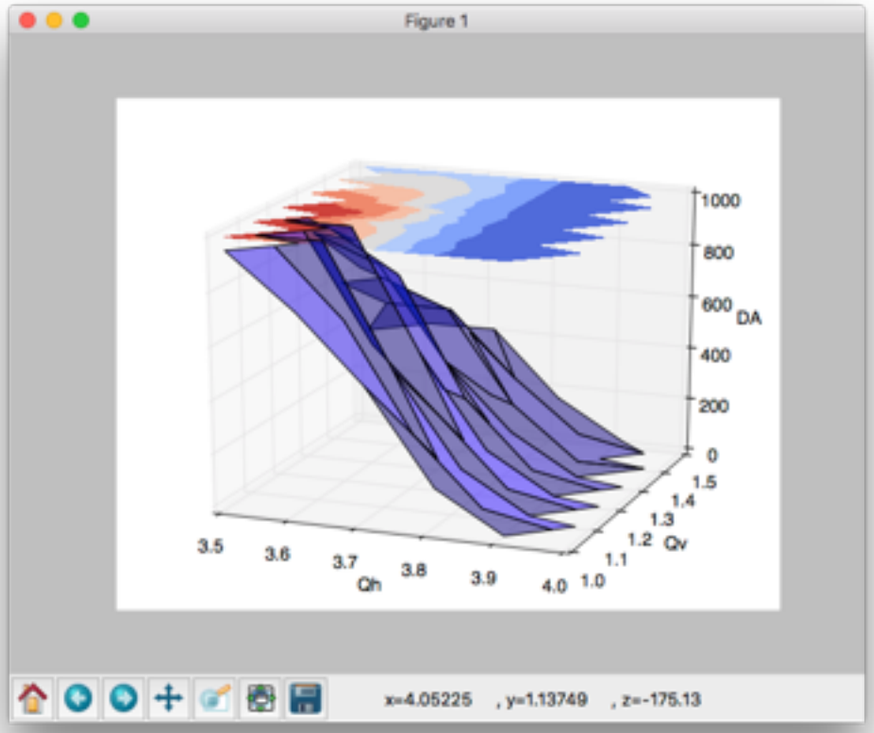
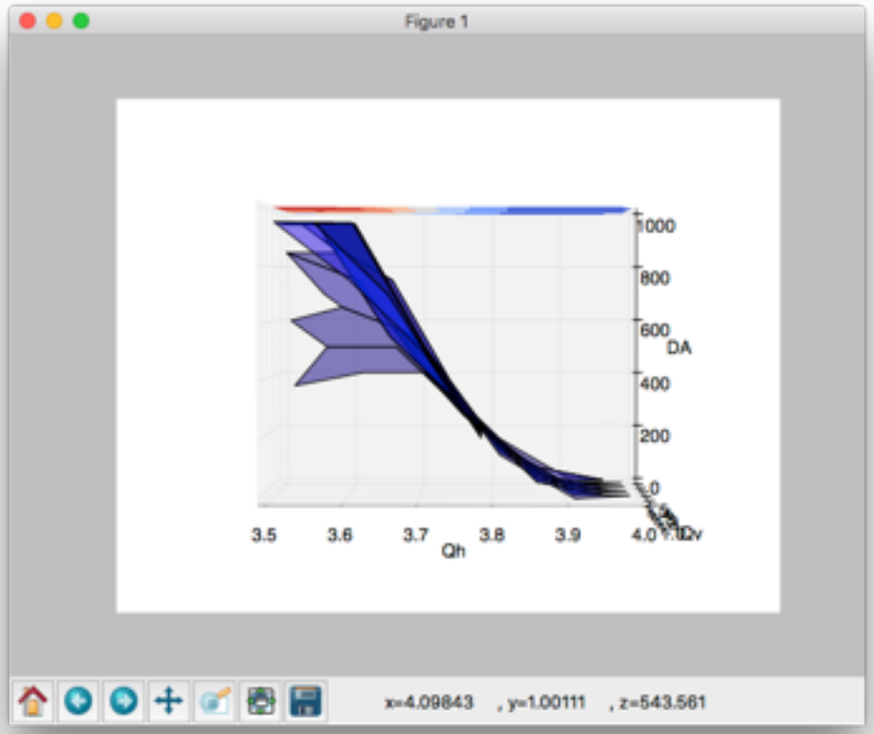
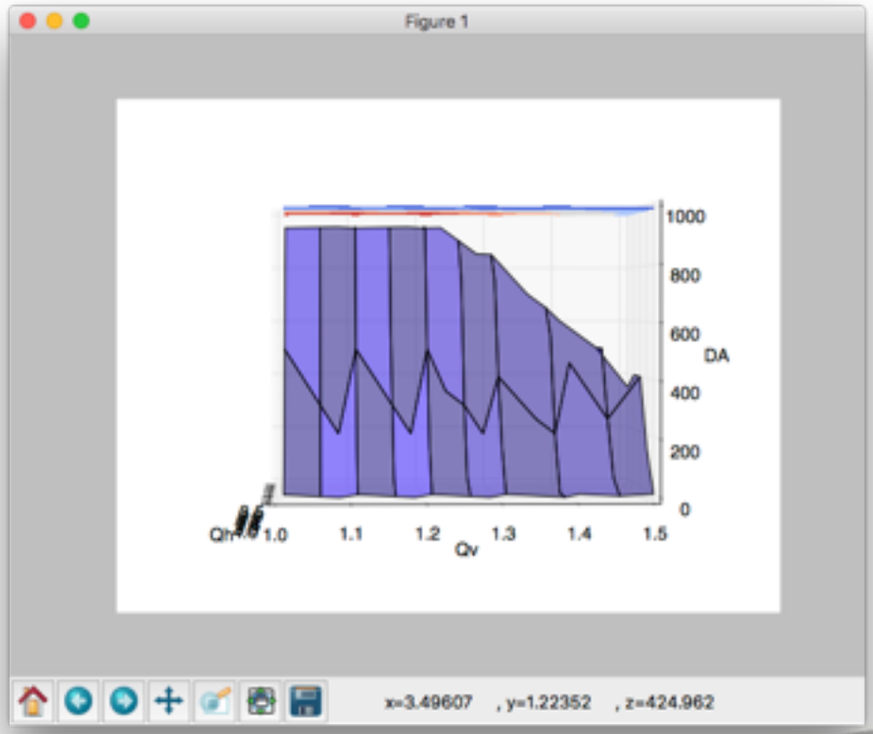
Tune scan result



DA decreases with Qh.



Less sensitive with Qv.



c.f. ~ 600 pi at Qh=3.7, agree with TOSCA tracking.

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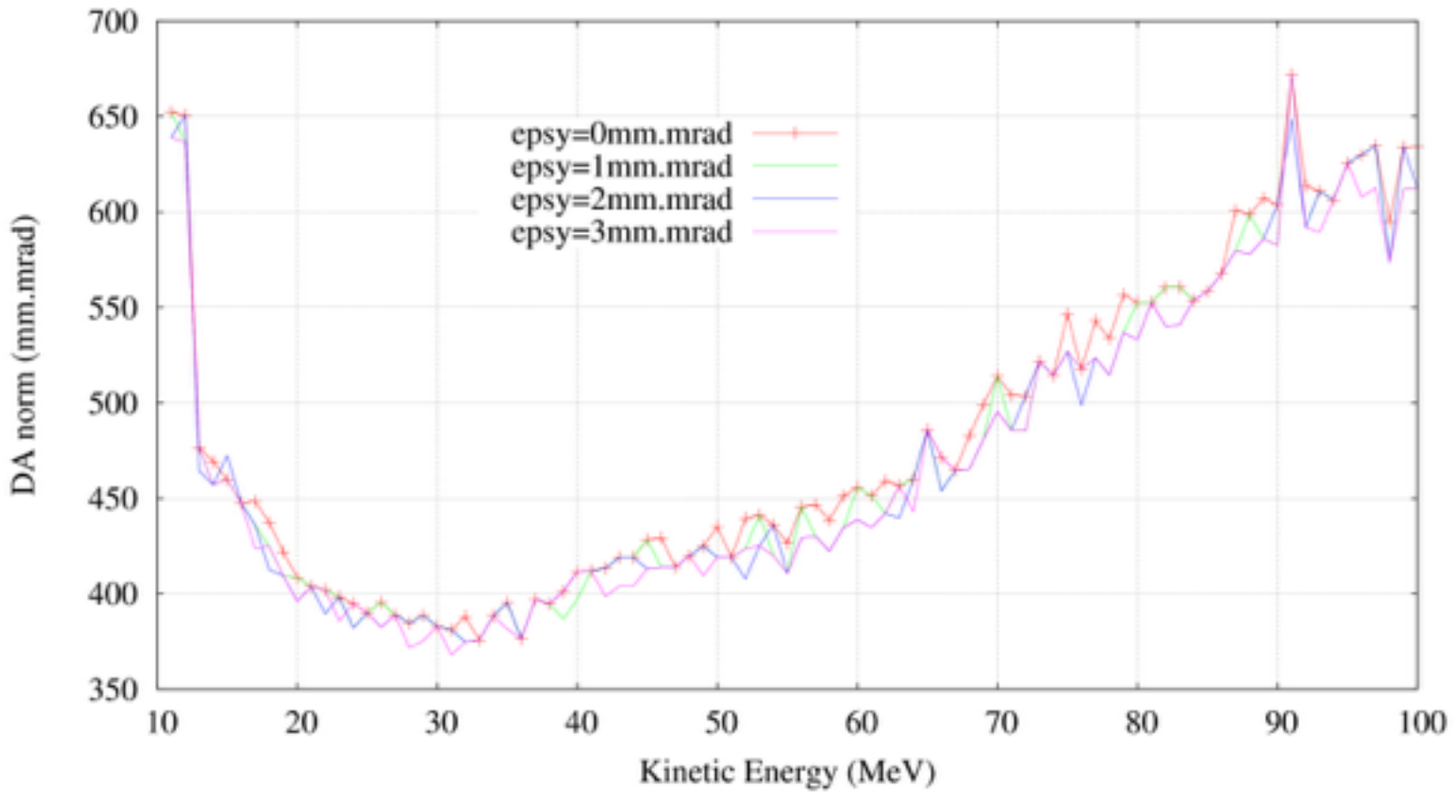
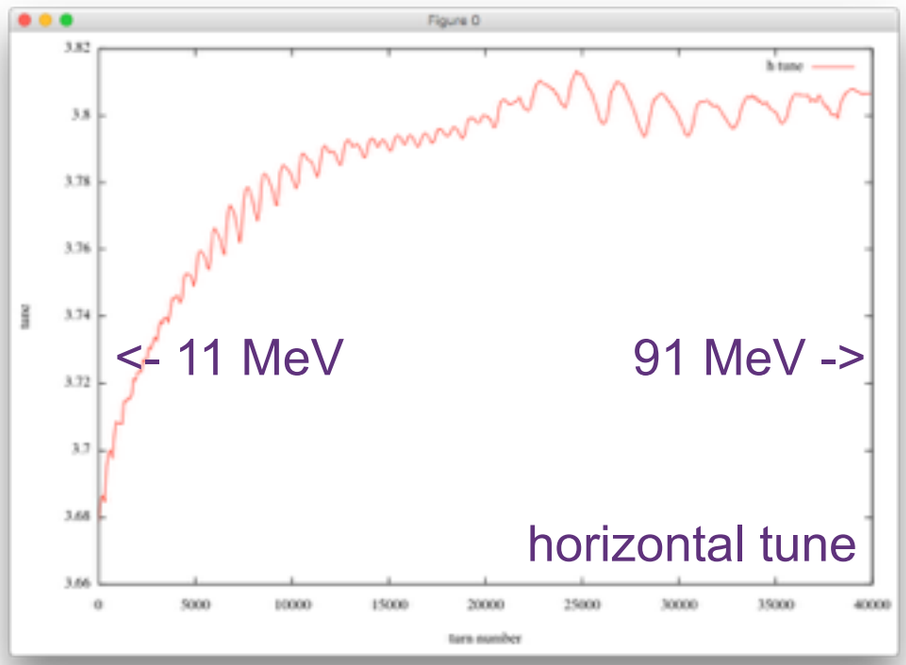
Interpretation

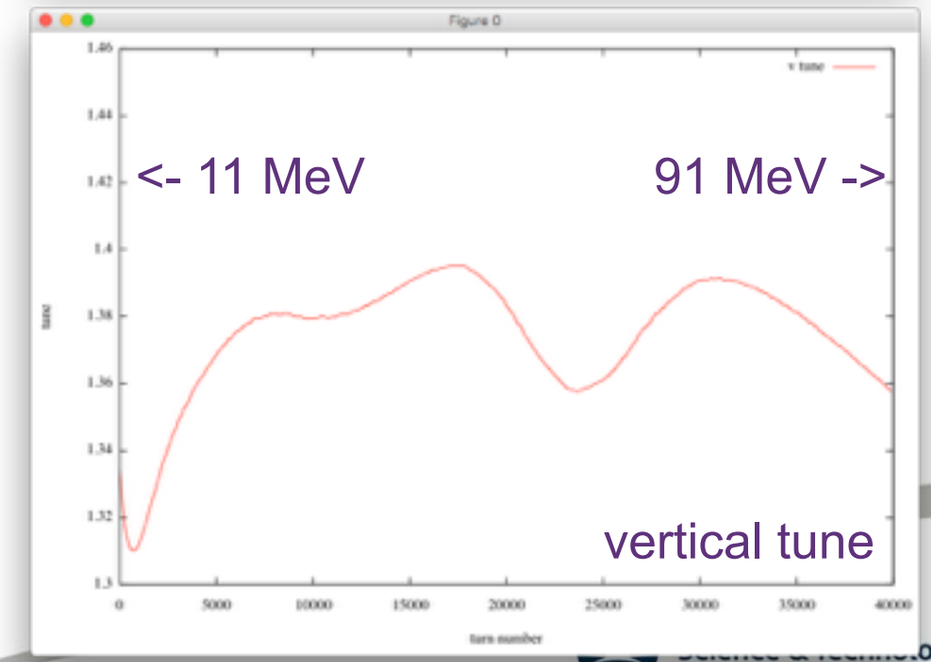
DA becomes minimum around 30 MeV because of high Qh.

DA increase with energy because of adiabatic damping.

bg(90MeV)/bg(30MeV)=1.8







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Summary

- Trend of dynamic aperture vs energy is almost explained by tune dependence.
- Tune scan with finer grid points is running.
- Tune scan with wider tune space is running.

vertical tune

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