RF stacking at extraction momentum

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Motivation

- Some application needs 100 Hz or less repetition rate although FFAG itself is operated with 1 kHz or more.
- Accumulation at injection is not a good idea because it makes bunch current more.
- This is for a scaling proton driver.

Model

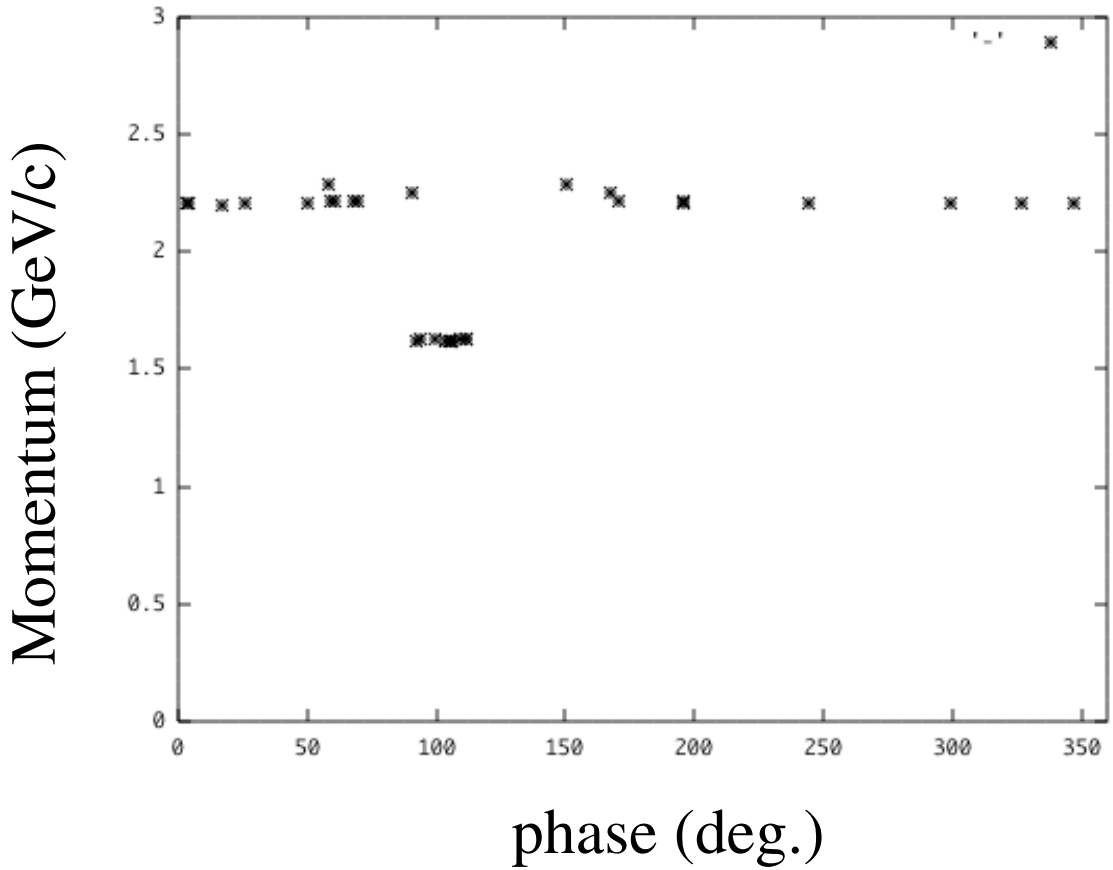
- Longitudinal simulation only for 1.5GeV proton FFAG.
- Two independent parameters can be optimized. More freedom than a conventional synchrotron.
  - Voltage or acceptance
  - Rate of acceleration
- Initial beam parameters
  - dp/p = +-0.001 (rms)
  - phase spread = +-30 deg. (rms)

Another important parameter

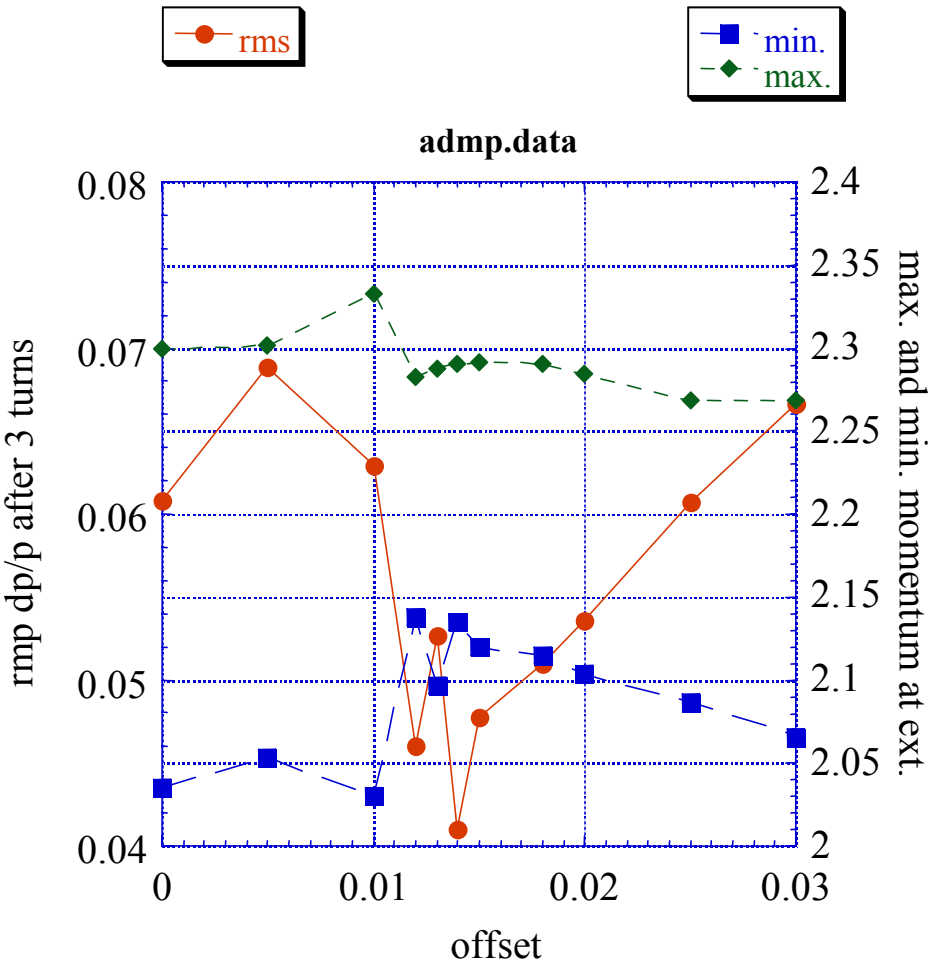
- Timing of RF off or how closely 2nd or later bunch should be aligned on phase space.

Snapshot of longitudinal phase

(gnuplot movie)



Parameter search



Timing of RF off (1.-x)

Summary

- Longitudinal RF stacking at the final momentum of 1.5 GeV FFAG is simulated.
- Optimization is not enough. The final momentum spread is an order of percent after a few pulse stacking.
- Bunch spacing for kicker is kept by barrier (it is not included in simulation).