



Beam echoes in the iota

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# What is my project

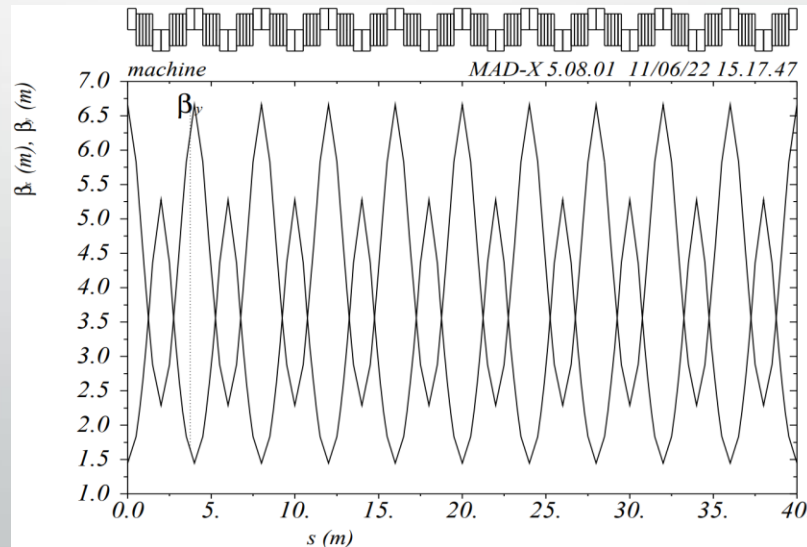
- Study beam echos in iota(Integral Optics Test Accelerator) for better measurement meant of diffusion
- With and without space charge
- Use pyORBIT to run simulation
- Goal is to Find parameters that maximizes beam echos

# Background

- Beam diffusion- consequence of many effects of an accelerator such as intensity, space charge, beam to beam interactions and more. Diffusion leads to particle loss so it is desirable to measure it.
- Beam echo- the recoherence of particles in phase space after they have gone through decoherence.
  - Achieved by dipole kick then quadropole kick
  - Beam echo amplitude strongly depends on diffusion rates and other parameters such as tunes, coupling, chromacitiy, and more.

# So far

- Been using madx to run simple fodo lattice examples
- Learning the jargon of madx to be ready run simulation of the iota lattice
- Produce simple plots from madx



# Whats next?

- Run madx with iota lattice
- Observe a beam echo and analyze
- Run pyOrbit with space charge
- Observe beam echo with space charge
- Analyze and make conclusions