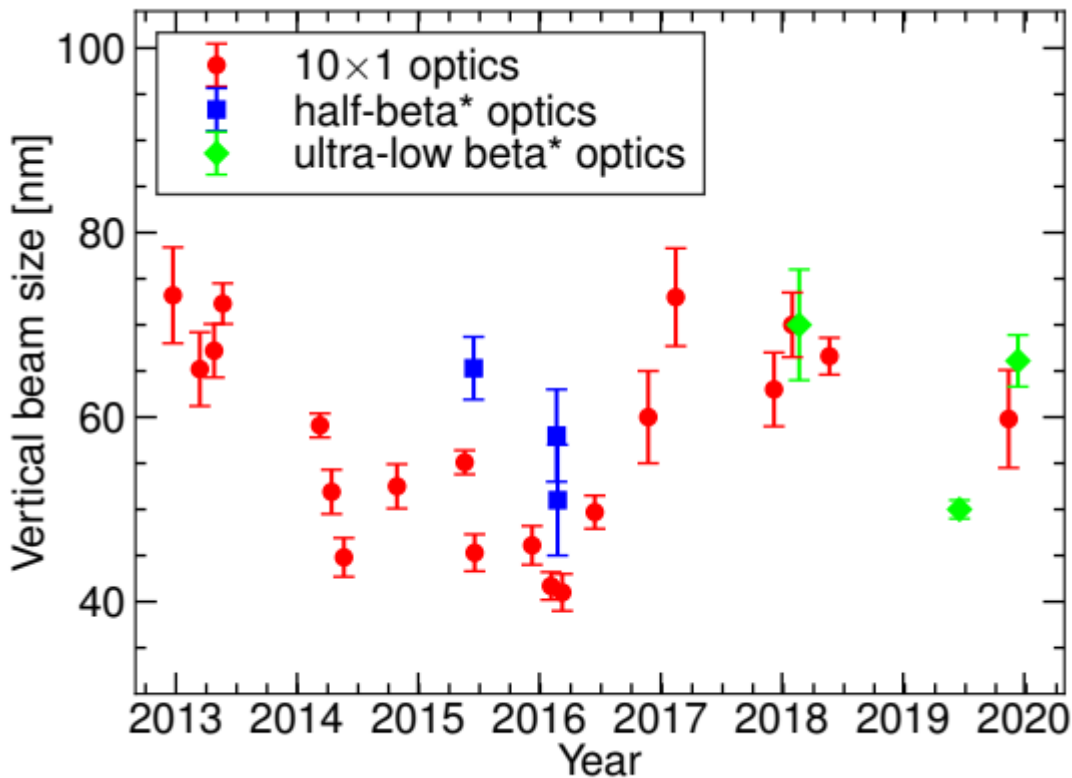


Ultra-low studies in ATF3: The past



Open questions:

- Field quality of magnets
- Need octupoles? & octupole alignment
- IP beam size measurement performance
- Effect of orbit jitter
- Wakefields
- Orbit control

The ideal ATF3

- Superconducting final quadrupoles as ILC to verify field quality and interplays between nested coils.
- Robust IP beam size monitor down to 20 nm with about 1nm resolution
- Robust IP beam position monitors with resolution about 5nm to disentangle impact of IP jitter to beam size
- Robust multibunch orbit feedback and feedforward

IP instruments will be critical

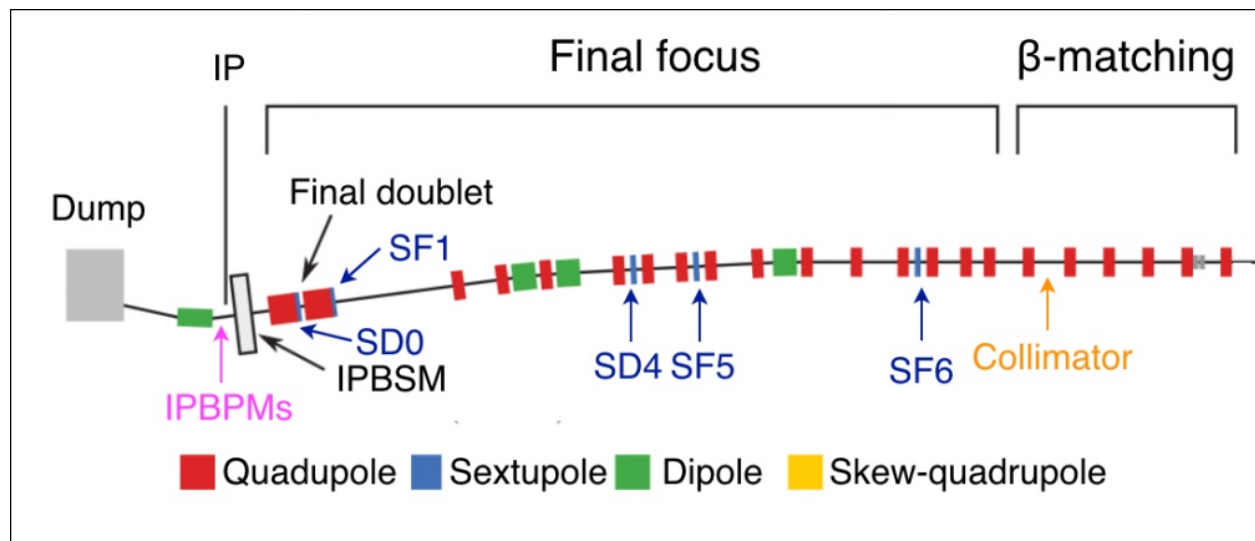
- If beam size monitor and beam position monitors do not achieve goals by about factor 2 mitigation exists
- Increase L^* by about factor 2:

Two options:

- move FD to the right, or
- move IP towards the dump, or
- both.

Optics design not trivial.

Andrii will look at this during 2021.



Resources, Manpower

- The success of any study in ATF3 will need strong operation support (weekends?)
- For ultra-low studies in the past it was fundamental to have one experienced fellow and one or two students.
 - The hardest was to tune the beam size continuously for days, facing unexpected problems