Tutorial 1

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TUTORIAL 1: FIRST PART

My first MADX job.

Check that your console is working as expected with the following example.

1. Open an editor and write your first MADX input file (just 1 line like “stop;” or “exit;” or “quit;”).
2. Run it. If all is fine, nothing interesting should happen.

Tutorial 1: Second Part

My first accelerator.

1. Make a simple lattice cell of $L_{cell} = 100$ m made of a focusing and a defocusing quad (so called FODO cell). Each quad is $L_{quad} = 5$ m long. Put the start of the first quadrupole at the start of the sequence. Each quad has a focal length of $f = 200$ m ($K1 \times L_{quad} = 1/f$ in thin lens approximation).
2. Define a proton beam at $E_{tot} = 2$ GeV. Activate the sequence, try to find the periodic solution and plot the β-functions. If you found $\beta_{max} \approx 460$ m you succeeded.
3. Using the plot you obtained can you estimate the phase advance of the cell? Compare with the tunes obtained from the TWISS.
4. Try with $E_{tot} = 0.7$ GeV: what is the MADX error message?
5. Try with $f = 20$ m: what is the MADX error message?