# **MADX TUTORIAL 1**

My first accelerator.

1. Make a simple FODO cell of *Lcell* = 100 m. Each quad is *Lquad* = 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 (*K*1 × *Lquad* = 1/*f* in thin lens approximation).
2. Define a proton beam at *Etot* = 2 GeV. Activate the sequence, try to find the periodic solution and plot the β-functions. If you found β*max* ≈ 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 *Etot* = 0.7 GeV: what is the MADX error message?
5. Try with *f* = 20 m: what is the MADX error message?



Note: all the MADX tutorials have been prepared by **Dr. Guido Sterbini** for the Joint University Accelerator School in Archamps in 2018.