



MAD-X

Bruce Yee Rendón

byee@post.j-parc.jp

Accelerator Division

Japan Proton Accelerator Research Complex (J-PARC)

High Energy Accelerator Research Organization (KEK)

Luis Eduardo Medina Medrano

lmedinam@cern.ch

Beam Department

European Organization for Nuclear Research (CERN)

Universidad de Guanajuato (UG)

Acknowledgement to Werner Herr, CAS



Exercise by group

- **Exercise 1.** *A electron ring of 3 GeV, with a circumference of 400 m, with a dipole length of 4 m and quadrupole length of 5 m. Reduce the beta function around 35 m and correct the chromaticity.*
- **Exercise 2.** *A proton ring of 100 TeV, with a circumference of 100 km, with a maximum dipole length of 20 m and maximum quadrupole length of 5 m. Reduce the beta function around 350 m and correct the chromaticity.*

In both cases, make sure to plot the geometry of the ring, and the Twiss functions for single FODO cell and for the entire ring.