

Introduction to Particle Accelerators

Homeworks III

1 Weak focusing synchrotron

We consider a weak focusing synchrotron composed of 4 periods “F-O” where the straight sections “O” have a length l and the bending sections “F” have a length L .

Derive the transfer matrix of one period.

Establish the stability conditions on l to obtain horizontal and vertical stability.

Derive the expression for ν in both planes as a function of the field-index n and $\delta = R/\rho$.