

Accelerator Physics for an ERL x-Ray Source

Homework 1

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March 10, 2008

Exercise 1:

Find the radial dependence of the magnetic field $B_z(r)$ in an isocyclotron with angular frequency ω_z .

Exercise 2:

Consider a microtron with one accelerating cavity ($l = 1\text{m}$, $g = 30\text{MV/m}$) and $\omega_{RF} = 2\pi \cdot 1.3 \times 10^9\text{Hz}$. What is the proper value of the magnetic field B ?

Exercise 3:

In a Wideroe linear accelerator, what is the limit of the drift tube's length as the speed of particles $v \rightarrow c$?