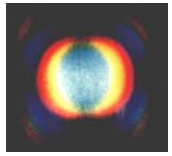

# Study Session

-1 Specify a $1.8\ \mathrm{m}$ (arc length) long bending magnet that is capable to deflect a $3\ \mathrm{GeV}$ electron beam by an angle of $\pi/12$. This is the deflection angle of PLS-II. Assume a full gap aperture of $34\ \mathrm{mm}$. What is the total excitation current in each coil? Determine the bending radius and sagitta. How many magnets do you need to define a circular accelerator?

-2 A quadrupole magnet shall focus a parallel beam to a focal point $4\ \mathrm{m}$ away from the center of the quadrupole. The beam energy be $3\ \mathrm{GeV}$. Choose a magnet length and calculate the magnetic field gradient necessary.

-3 Specify a Rf-cavity (pillbox cavity) for microwaves with a wavelength of 60 cm. What is the diameter of the pill box? How long must the cavity be if an electron at the speed of light ( v~c ) is expected to travel through the cavity in one half Rf-period. Express this cavity length in units of the Rf-wavelength. What is the Rf-frequency?