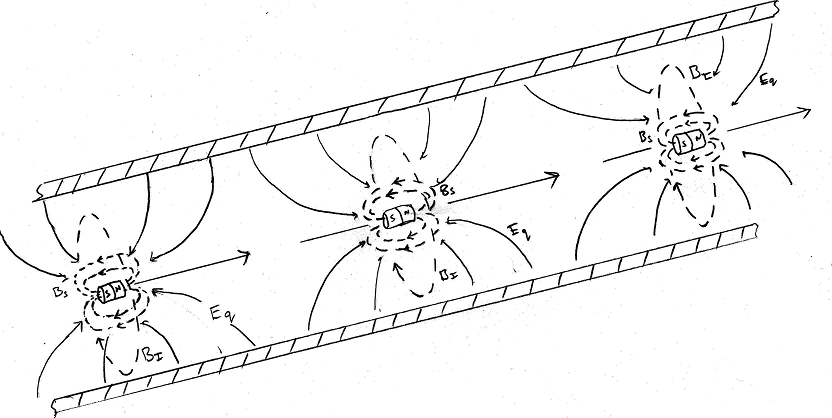
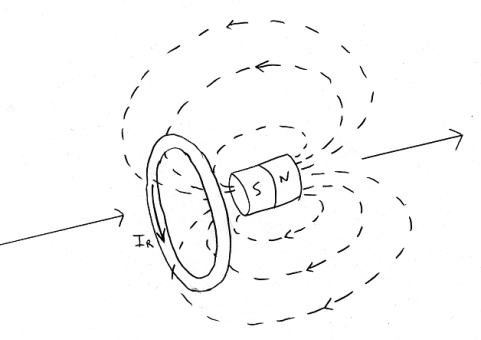
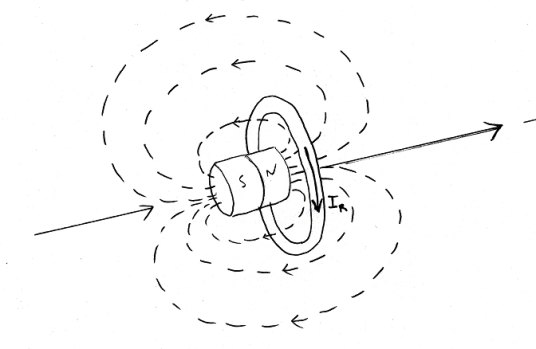
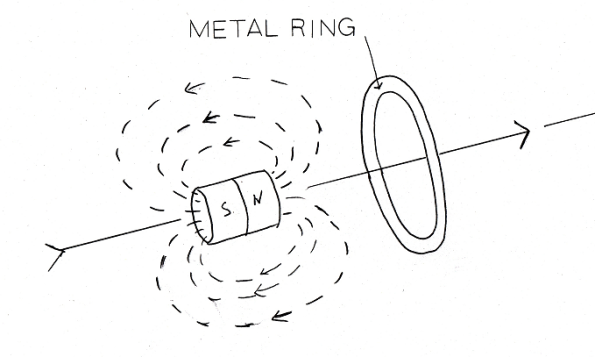
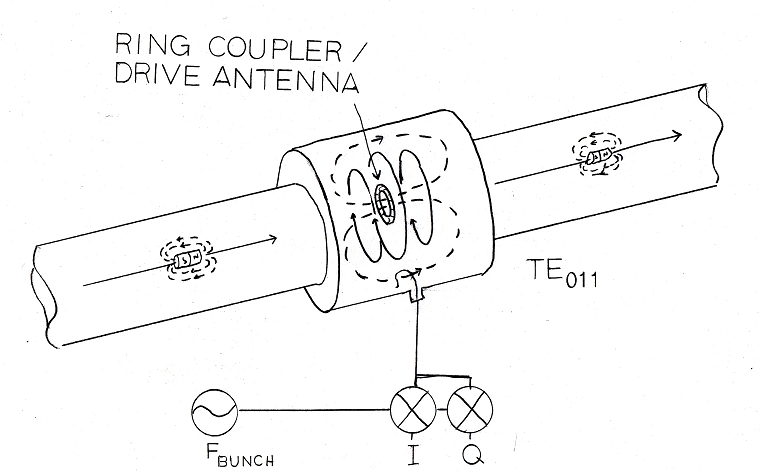
Ring Coupled Cavity Polarimeter:

The drawing of the beam pipe below is intended to help visualize the primary fields of a bunched polarized electron beam traveling down a beam pipe. The electron bunches are depicted as tiny bar magnets to show their magnetic dipole field due to spin alignment. The electrostatic field , and the magnetic field from the beams current are coupled to the conductive walls of the beam tube, so they excite resonant structures built into the beam tube. The dipole field of the bunches spinis more localized to the bunch and drops off radially as making it less interactive with the beam pipe and resonant structures built into it.

A small metal ring could be used to extract energy from the beams polarization field as the bunches pass through it, inducing ring current .



If the small metal ring were placed within a resonant cavity, the ring could serve a dual purpose; as a coupler to extract energy from the beams polarization field, and as a drive antenna for an axially symmetric transverse electric resonant cavity mode. The is shown below. The relative phase of the cavity mode can be compared to the accelerators clock, when the polarity of the beam flips, so do the DC I and Q voltages. The ring could be suspended with radial metal spokes without disrupting axially symmetric TE modes.



Acknowledgements: Poelker, Derbenev, Talman etc…