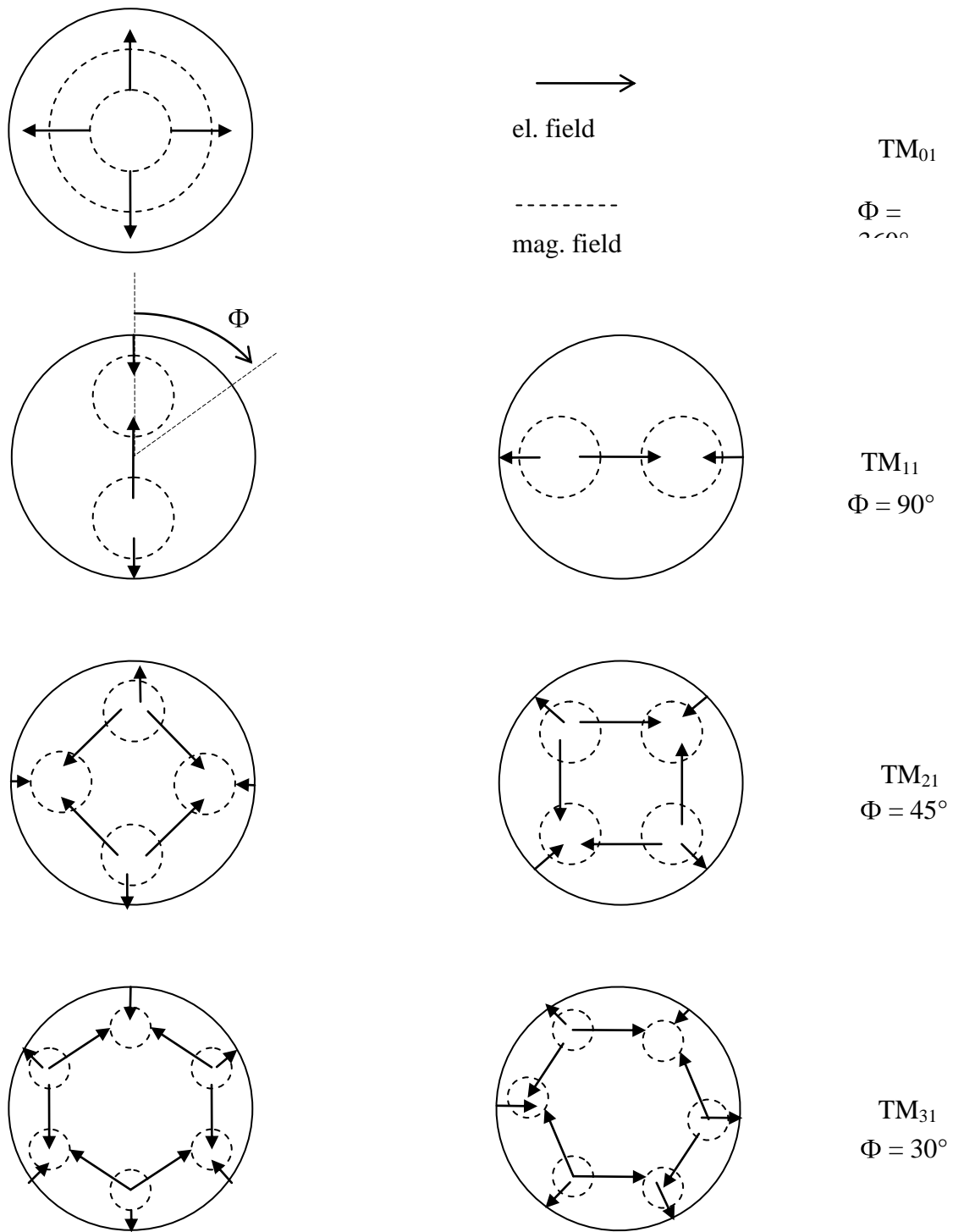


On the Positioning of Power coupler/HOM ports

1. The power coupler should direct either vertically up or down; from reasons of clean assembly there is no a priori preference;
2. The HOM coupler port at the cavity end that carries the power coupler should direct in the opposite direction in order to ease the manufacture of the end group;
3. As we want to keep the possibility to attach a HOM antenna to the HOM coupler port, the inner part of which is actively cooled with IHe, the HOM coupler port should point vertically upwards; hence the power coupler should direct vertically downwards;
4. There is no a priori preference for the HOM coupler port at the opposite cavity end that carries the tuner. However, supposing that the power coupler polarizes the dipole mode (which is yet not proven), we shall put the HOM coupler port at a position that allows in principle equal coupling for the dipole and quadrupole modes; we disregard the sextupole mode. Inspecting the outline attached this position should be located at an angle of 60 degrees, measured from the top.

In conclusion:

The power coupler points vertically downwards, the HOM coupler port at this same end points vertically upwards, and the HOM coupler port at the opposite end points upwards at 60 degrees from the vertical.



Condition for identical E-field at HOM antenna for dipole and quadrupole mode:
 $\sin\Phi = \sin(2\Phi) \Rightarrow \Phi = 60^\circ$