

Homework

Calculate the resonant frequency of the fundamental mode in a 'coca-cola' tin



assume a cylindrical shape
with a diameter of 6.4 cm and a height of 12.1 cm

$$\omega = c \frac{x_{01}}{R} = 3 \cdot 10^8 \frac{2.405}{0.032} = 2.25 \cdot 10^{10} \text{ rad} \cdot \text{s}^{-1}$$

$$f = \frac{\omega}{2\pi} = 3.6 \text{ GHz}$$

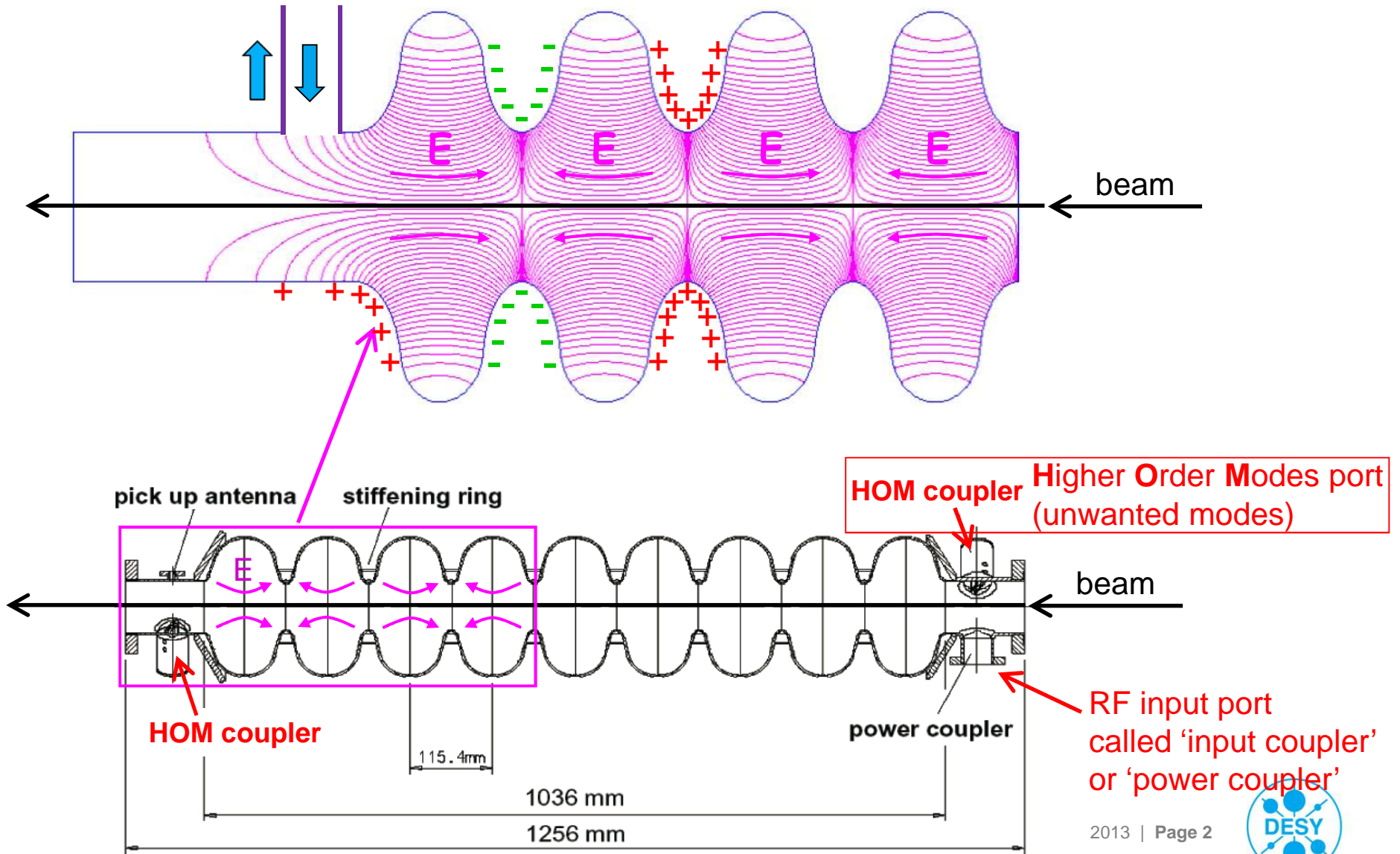
Microwave frequency bands

Letter Designation	Frequency range	Wavelength range	Typical uses
L band	1 to 2 GHz	15 cm to 30 cm	military telemetry, GPS, mobile phones (GSM), amateur radio
S band	2 to 4 GHz	7.5 cm to 15 cm	weather radar, surface ship radar, and some communications satellites (microwave ovens, microwave devices/communications, radio astronomy, mobile phones, wireless LAN, Bluetooth, ZigBee, GPS, amateur radio)
C band	4 to 8 GHz	3.75 cm to 7.5 cm	long-distance radio telecommunications
X band	8 to 12 GHz	25 mm to 37.5 mm	satellite communications, radar, terrestrial broadband, space communications, amateur radio
K _u band	12 to 18 GHz	16.7 mm to 25 mm	satellite communications

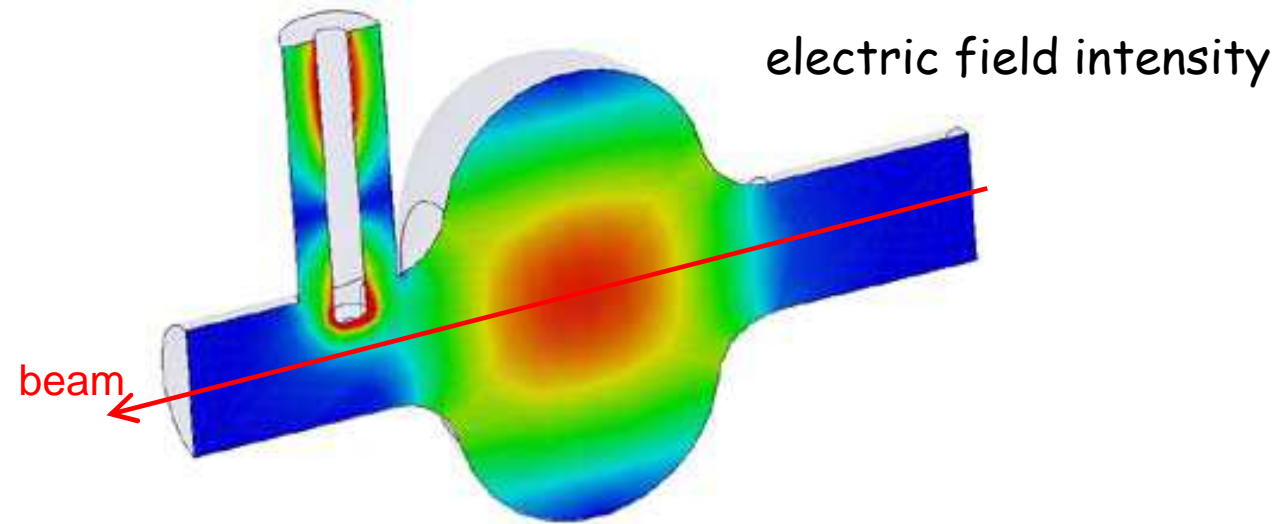
<http://en.wikipedia.org/wiki/Microwave>

Accelerating field map

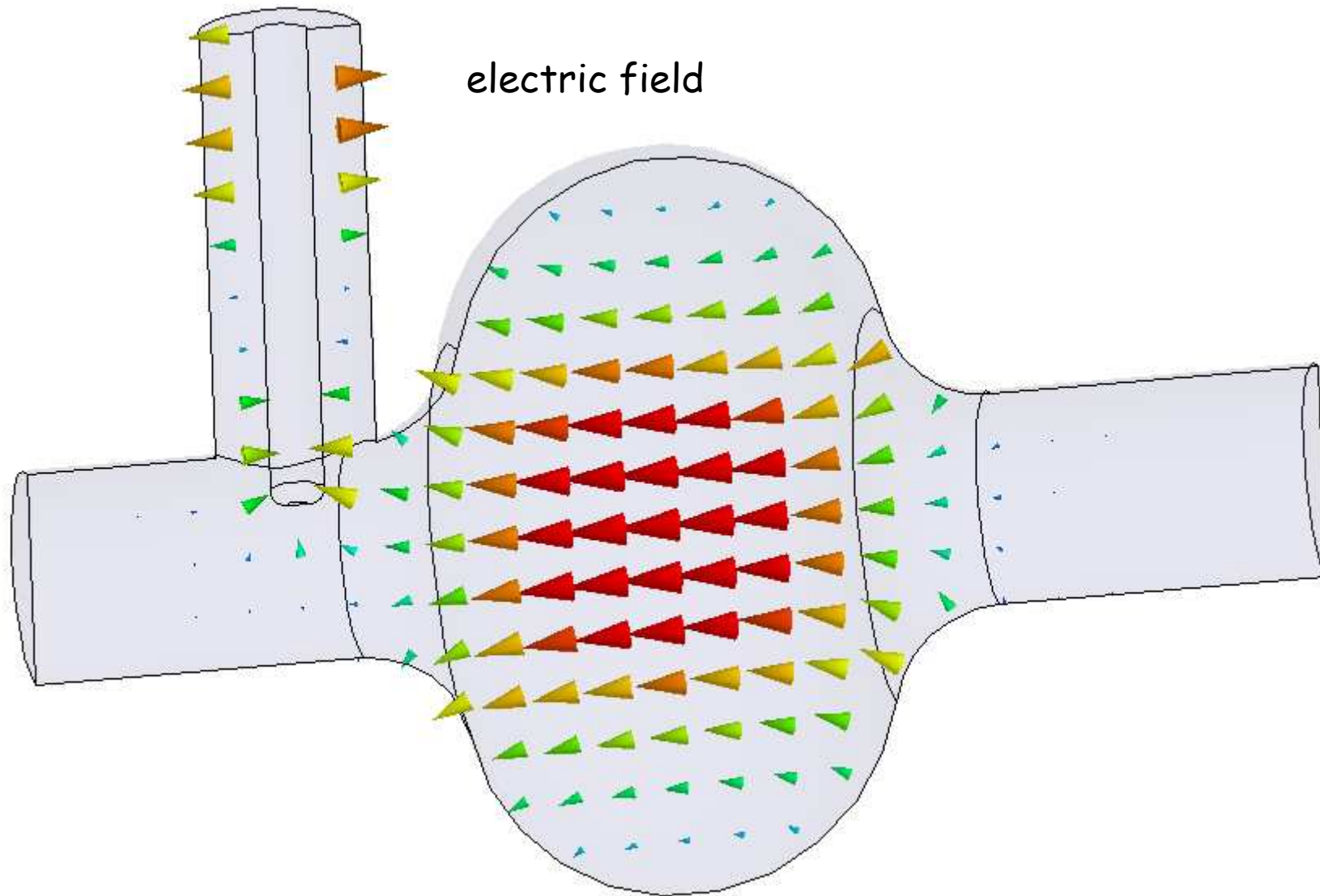
Simulation of the fundamental mode: electric field lines



Fundamental mode coupler

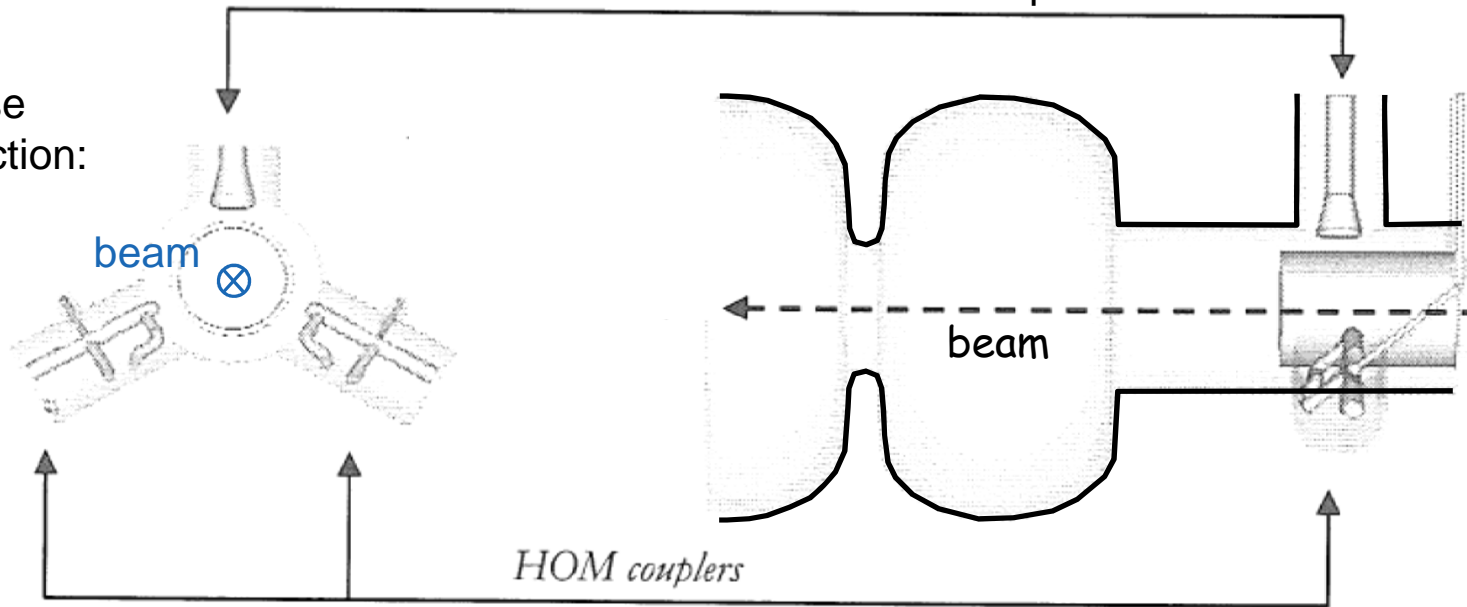


Fundamental mode coupler



RF input port
called 'input coupler'
or 'power coupler'
or 'fundamental mode coupler'

transverse
cross section:



Higher order mode couplers

HOM couplers

