

outcome:

learned about TM wave propagation in
metal plates.

Aim:

To investigation about TEM waves in
parallel plates

transverse EM waves:

The lowest order TEM mode is TE_{10} .

TM mode \rightarrow TM_{00}

The field strength for TM waves

$$H_y = C_4 \cos \left[\frac{m\pi}{a} x \right] e^{-j\beta z}$$

$$E_x = \frac{\rho}{\omega \epsilon} C_4 \cos \left[\frac{m\pi}{a} x \right] e^{-j\beta z}$$

$$E_z = \frac{j m \pi}{\omega \epsilon a} C_4 \sin \left[\frac{m\pi}{a} x \right] e^{-j\beta z}$$

It's a special type of TM wave in which
the electric field E along the direction of
propagation is also zero.

For TEM waves, $E_z = 0$

$$H_y = C_4 e^{-j\beta z}$$

$$E_x = \frac{\rho}{\omega \epsilon} C_4 e^{-j\beta z}$$

$$E_z = 0$$

The TEM waves are waves in which both
electric and magnetic fields are transverse
entirely but has no comp. of E_z and H_x .
It's referred to as principal waves.

outcome:

investigation about the TEM waves in
metal plates.