AMPERE - MAXWELL LAW

CONDUCTION CURRENT — DISPLACEMENT CURRENT

$$\oint_C \bar{B} \cdot \hat{t}\, dc = \mu_0 \left[I + \varepsilon_0 \frac{d}{dt} \int_S \bar{E} \cdot \hat{n}\, ds \right]$$

INTEGRAL FORM OF AMPERE-MAXWELL

- $\oint_C \bar{B} \cdot \hat{t}\, dc$: CIRCULATION OF $\bar{B}$ FIELD
- I: CURRENT ENCLOSED (THROUGH SURFACE BOUNDED BY C)
- $\int_S \bar{E} \cdot \hat{n}\, ds$: FLUX OF $\bar{E}$ FIELD

> AN ELECTRIC CURRENT OR A CHANGING FLUX THROUGH A SURFACE PRODUCES A CIRCULATING MAGNETIC FIELD AROUND ANY PATH THAT BOUNDS THAT SURFACE

APPLYING STOKES THEOREM, WE CAN ARRIVE TO THE DIFFERENTIAL FORM:

$$\nabla \times \bar{B} = \mu_0 \left[\bar{J} + \varepsilon_0 \frac{\partial \bar{E}}{\partial t} \right]$$

DIFFERENTIAL FORM OF AMPERE-MAXWELL

$\bar{J}$: A/m^2