

Chapter 31: Faraday's Law

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1 Units and Variables

B - magnetic field, in teslas

μ_0 - permeability of free space

I - current on a wire, in amperes

r - distance, in meters

ℓ - length of a wire, in meters

Φ - magnetic flux, in Tm^2

N - number of turns

ϵ_0 - permittivity of free space

2 Equations

Faraday's Law of Induction

$$\xi = -\frac{d\Phi_B}{dt} = -\frac{d}{dt}(BA \cos \theta) = \oint E \cdot ds$$

Induced emf in a rotating bar of length ℓ

$$\xi = -B\ell v$$