$$E = -N\frac{d\phi}{dt} = \frac{-d\lambda}{dt}$$ Faraday-Lenz's Law

Two-Pole Single-Phase Machine

$$B_F(\rho) = B_{Fmax}\cos\rho$$ Airgap flux density

$$\rho = \gamma - \theta$$

- θ Rotor Position
- γ Arbitrary position of magnetic flux
- ρ Relative arbitrary position compared to rotor axis

$$\phi_{Af}(\theta) = 2l_c r_{gap} B_{max}\cos\theta$$ Flux linkage (Coil A)

Flux Linkage: Created by rotor winding magnetic field through coil A.

- l_c Cylindrical length of rotor
- r_{gap} Effective radius of air gap