

A NOTE ABOUT FLUX CHANGE IN FARADAY'S LAW

Recall that magnetic flux is defined as:

$$\Phi_B = BA \cos \theta \text{ (text, equation 20.1, page 733).}$$

(See Figure 20.2 in the text.)

Faraday's law of induction gives induced emf
(equation 20.2, top of page 667) as:

$$\mathcal{E} = -N \frac{\Delta \Phi_B}{\Delta t}.$$

The change of flux, $\Delta \Phi_B$, can result from a change of field, ΔB , or a change of area, ΔA , or a change of angle, $\Delta \theta$, over a time interval Δt .

If the area changes, use $\Delta \Phi_B = B \cdot \Delta A$.

If the field changes, use $\Delta \Phi_B = A \cdot \Delta B$.

If the angle changes, use $\Delta \Phi_B = BA(\cos \theta_f - \cos \theta_i)$.