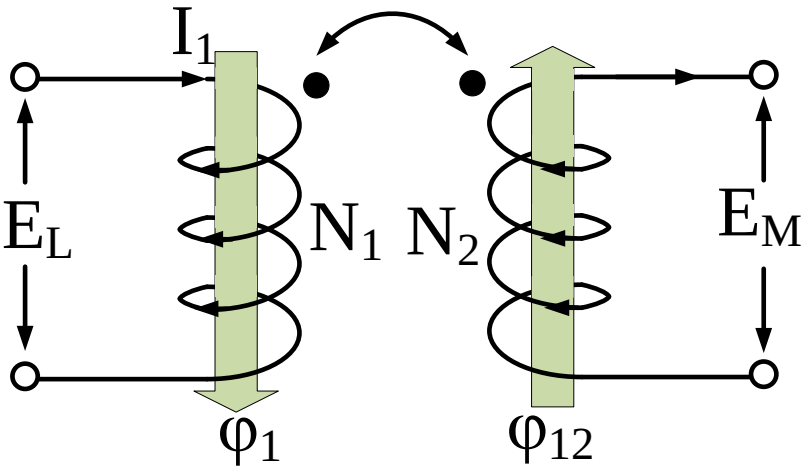
自感與互感



自感

$$L_1 = \frac{\lambda_1}{I_1} = \frac{N_1\varphi_1}{I_1}$$

自感應電勢

$$E_L = \frac{N_1\Delta\varphi_1}{\Delta t} \Rightarrow \text{法拉第定律}$$

互感

$$M_{12} = \frac{\lambda_{12}}{I_1} = \frac{N_2\varphi_{12}}{I_1}$$

$$K = \frac{\varphi_{12}}{\varphi_1}$$

互感應電勢

$$E_M = \frac{N_2\Delta\varphi_{12}}{\Delta t}$$

整合公式

$$L(\text{自感}) \text{ or } M(\text{互感}) = \frac{\lambda(\text{產生的磁通鏈})}{I(\text{加入的電流})} = \frac{\varphi(\text{產生的磁通}) \times N(\text{所經之匝})}{I(\text{加入的電流})}$$