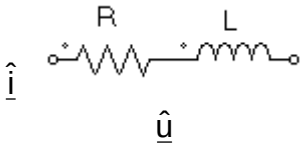
Zeitintegriertes Potenzial



$$\underline{Z} = R + j \cdot \omega \cdot L = R + j \cdot X_L$$

$$\underline{\hat{i}} = \hat{i}_r + j \cdot \hat{i}_i$$

$$\underline{\hat{u}} = \hat{u}_r + j \cdot \hat{u}_i = \hat{u} \cdot e^{j \cdot \varphi_u}$$

$$\int \underline{u} \cdot dt = \int \hat{u} \cdot e^{j(\omega t + \varphi_u)}$$

$$\int \underline{u} \cdot dt = \hat{u} \cdot e^{j\varphi_u} \cdot \frac{1}{j\omega} e^{j\omega t}$$

$$\int \underline{\hat{u}} = \frac{1}{j\omega} \cdot \hat{u} \cdot e^{j\omega t} = \frac{\hat{u}_i}{\omega} - j\frac{\hat{u}_r}{\omega}$$

Vergleich normales Potenzial: u mit zeitintegriertem Potenzial: v

$$\hat{v}_r + j\hat{v}_i = \frac{\hat{u}_i}{\omega} - j\frac{\hat{u}_r}{\omega}$$

ergibt:

$$\hat{u}_r = -\omega \cdot \hat{v}_i \quad \text{bzw.} \quad \hat{u}_i = \omega \cdot \hat{v}_r$$