

$$\underline{U} = \underline{\hat{U}}e^{j\omega t} = \hat{u}e^{j\varphi_u}e^{j\omega t}$$

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

Zeitintegriertes Potenzial $\underline{V} = \underline{\hat{V}}e^{j\omega t}$

$$\underline{V} = \int \underline{U} dt = \int \hat{u}e^{j\varphi_u}e^{j\omega t} dt = \hat{u}e^{j\varphi_u} \underbrace{\frac{1}{j\omega}}_{\underline{\hat{V}}} e^{j\omega t}$$

$$\underline{\hat{V}} = (\hat{u}_r + j\hat{u}_i) \frac{1}{j\omega} = \frac{\hat{u}_i}{\omega} - j\frac{\hat{u}_r}{\omega} = \hat{v}_r + j\hat{v}_i$$

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