

Chapitre 7

Application 1

Décalage temporel $|\Delta t| = 0,25 \text{ s}$

Période = 1 s

$$\Delta\varphi = - \underbrace{\frac{2\pi}{T}}_{\text{retard}} |\Delta t| \quad \Delta\varphi = -\frac{\pi}{2} \quad (\text{quadrature})$$

Application 2

$$\bullet \underline{Z} = \underline{Z}_C + \underline{Z}_R = R + \frac{1}{jC\omega} = R - \frac{j}{C\omega}$$

$$\bullet \underline{Z} = \frac{\underline{Z}_C \cdot \underline{Z}_R}{\underline{Z}_C + \underline{Z}_R} = \frac{\frac{1}{jC\omega} \times R}{\frac{1}{jC\omega} + R} = \frac{R}{1 + jRC\omega}$$

$$\bullet \underline{Z} = \underline{Z}_C + \frac{\underline{Z}_C \underline{Z}_L}{\underline{Z}_C + \underline{Z}_L} = \frac{1}{jC\omega} + \frac{\frac{1}{jC\omega} \times jL\omega}{\frac{1}{jC\omega} + jL\omega} = \frac{1}{jC\omega} + \frac{jL\omega}{1 - LC\omega^2}$$

$$\underline{Z} = j \left(\frac{L\omega}{1 - LC\omega^2} - \frac{1}{C\omega} \right)$$

Application 3

$$\underline{u} = \underline{e} \frac{R}{R + \frac{1}{jC\omega}} = \underline{e} \frac{jC\omega}{1 + jRC\omega}$$

$$|\underline{u}| = E \frac{C\omega}{\sqrt{1 + R^2 C^2 \omega^2}}$$

$$\Delta\varphi_{u/e} = \arg(\underline{u}) - \arg(\underline{e}) = \arg \frac{jC\omega}{1 + jRC\omega} = \frac{\pi}{2} - \arctan(RC\omega)$$

$\uparrow \arg(jC\omega)$

Application 4

$$\underline{i} = \underline{\eta} \frac{R}{2R + jL\omega}$$

$$|\underline{i}| = I \frac{R}{\sqrt{4R^2 + L^2\omega^2}}$$

$$\Delta\varphi_{i/\eta} = \arg(\underline{i}) - \arg(\underline{\eta}) = \arg\left(\frac{R}{2R + jL\omega}\right) = 0 - \overset{\text{arg}(R)}{\text{arctan}\left(\frac{L\omega}{2R}\right)}$$

$$\Delta\varphi_{i/\eta} = -\text{arctan}\left(\frac{L\omega}{2R}\right)$$