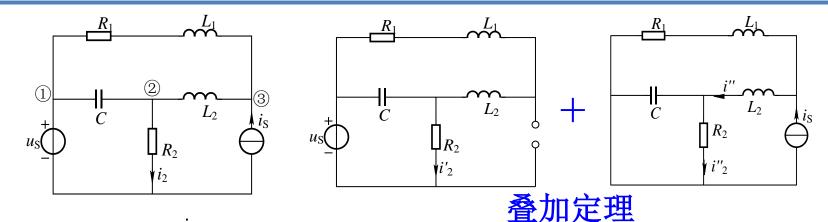
## 正弦稳态电路相量分析法





$$\frac{\dot{U}_{S}}{R_{2} + \frac{\dot{U}_{S}}{R_{1} + j\omega L_{1} + j\omega L_{2}) \cdot \frac{1}{j\omega C}}} = \frac{(2 - j2)V}{\frac{3}{1 + j}\Omega} = \frac{4}{3}A$$

$$\dot{I}'' = \frac{R_{1} + j\omega L_{1}}{Z + R_{1} + j\omega L_{1}} \dot{I}_{S} = \frac{2}{3}(-2 + j)A$$

$$\dot{I}''_{S} = \frac{R_{1} + j\omega L_{1}}{Z + R_{1} + j\omega L_{1}} \dot{I}_{S} = \frac{2}{3}(-2 + j)A$$

$$\dot{I}''_{S} = \frac{1}{\frac{j\omega C}{Z + R_{1} + j\omega L_{1}}} \dot{I}''_{S} = (-\frac{1}{3} + j)A$$

$$\dot{I}''_{S} = \frac{1}{\frac{j\omega C}{Z + R_{1} + j\omega C}} \dot{I}''_{S} = (-\frac{1}{3} + j)A$$

$$\dot{I}''_{S} = \frac{1}{\frac{j\omega C}{Z + R_{1} + j\omega C}} \dot{I}''_{S} = (-\frac{1}{3} + j)A$$

$$\dot{I}''_{S} = \frac{1}{\frac{j\omega C}{Z + R_{1} + j\omega C}} \dot{I}''_{S} = (1 + j)A = \sqrt{2} \times 45^{\circ}A$$

$$Z = j\omega L_2 + \frac{R_2 \cdot \frac{1}{j\omega C}}{R_2 + \frac{1}{j\omega C}} = \frac{1}{1 - j}\Omega$$

$$\vec{I}_{2}'' = \frac{\frac{1}{j\omega C}}{\frac{1}{j\omega C}} \dot{I}'' = (-\frac{1}{3} + j)A$$

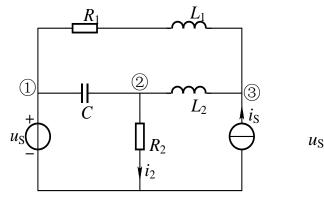
$$\dot{I}_{2}'' = \frac{\frac{1}{j\omega C}}{R_{2} + \frac{1}{j\omega C}} \dot{I}'' = (-\frac{1}{3} + j)A$$

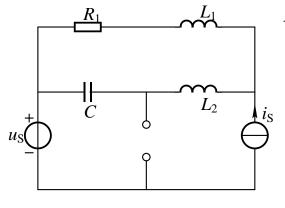
$$\dot{I}_{2} = \dot{I}_{2}' + \dot{I}_{2}'' = (1 + j)A = \sqrt{2} \angle 45^{\circ}A$$

## 正弦稳态电路相量分析法



例 3 已知  $u_s = 4\cos(100t - 45^\circ)$ V,  $i_s = 2.236\sqrt{2}\cos(100t + 153.43^\circ)$ A, C = 0.01F,





 $L_1 = L_2 = 0.01 \text{H}, R_1 = R_2 = 1\Omega,$ 求电流 $i_2(t)$ 。

等效电源定理

$$\dot{U}_{OC} = \frac{1}{j\omega C} \dot{I}_{C} + \dot{U}_{S} = \frac{1}{j\omega C} \cdot \frac{R_{1} + j\omega L_{1}}{R_{1} + j\omega L_{1} + j\omega L_{2} + \frac{1}{j\omega C}} \dot{I}_{S} + \dot{U}_{S} = 3V$$

$$Z_{i} = \frac{(R_{1} + j\omega L_{1} + j\omega L_{2}) \cdot \frac{1}{j\omega C}}{R_{1} + j\omega L_{1} + j\omega L_{2} + \frac{1}{j\omega C}} = (0.5 - j1.5)\Omega$$

$$\dot{I}_{2}(0.5 - j1.5) = (0.5 - j1.5)\Omega$$

$$\dot{I}_2 = \frac{\dot{U}_{OC}}{R_2 + Z_i} = \sqrt{2} \angle 45^{\circ} A$$

$$i_2(t) = 2\cos(100t + 45^\circ)A$$