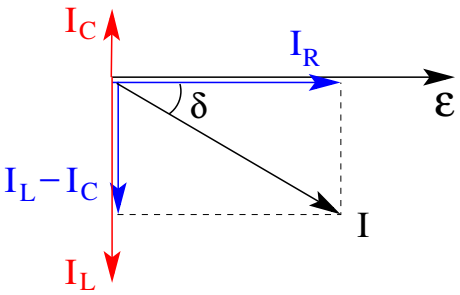
RLC Parallel Circuit (2)

Phasor diagram (for $\omega t = \delta$):



Current amplitudes:

- $I_{R,max} = \dfrac{\mathcal{E}_{max}}{X_R} = \dfrac{\mathcal{E}_{max}}{R}$
- $I_{L,max} = \dfrac{\mathcal{E}_{max}}{X_L} = \dfrac{\mathcal{E}_{max}}{\omega L}$
- $I_{C,max} = \dfrac{\mathcal{E}_{max}}{X_C} = \mathcal{E}_{max}\omega C$

Relation between $\mathcal{E}_{max}$ and I_{max} from geometry:

$$\begin{aligned} I_{max}^2 &= I_{R,max}^2 + (I_{L,max} - I_{C,max})^2 \\ &= \mathcal{E}_{max}^2 \left[\frac{1}{R^2} + \left(\frac{1}{\omega L} - \omega C \right)^2 \right] \end{aligned}$$