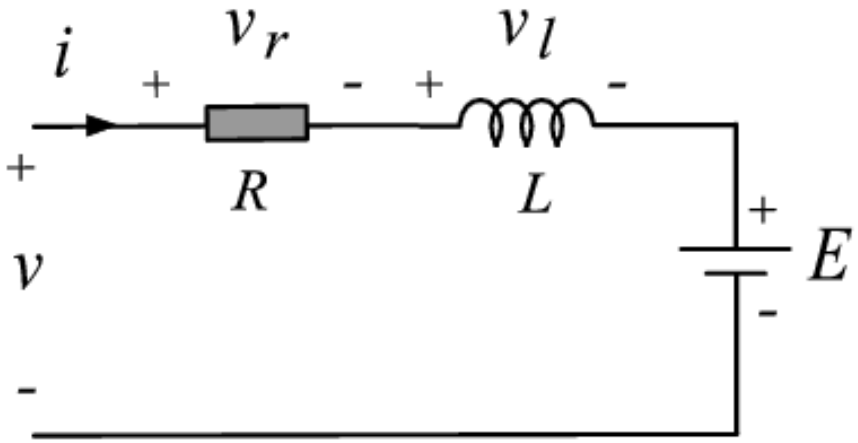
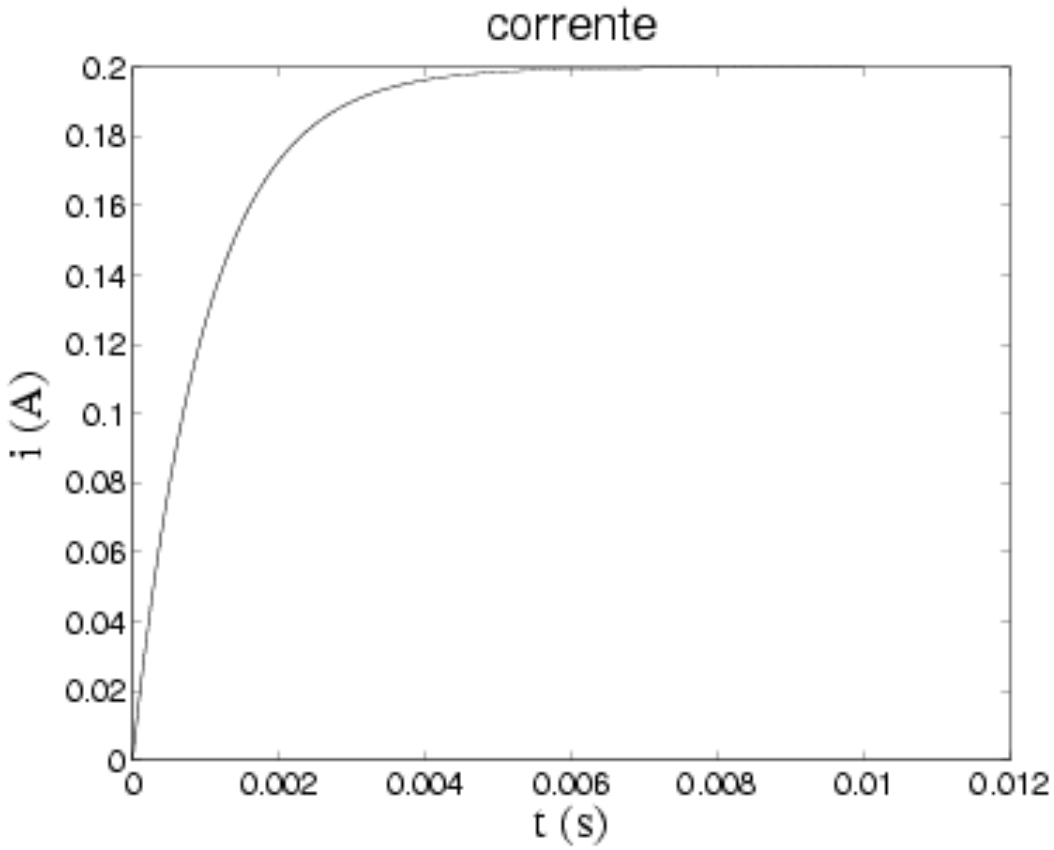
Carga RLE



$$v(t) = v_r(t) + v_l(t) + E = Ri(t) + L\frac{d}{dt}i(t) + E$$

Integração Numérica - 1



Integração Numérica - 2

Eq. contínua

$$Ri(t) + L\frac{d}{dt}i(t) = v(t) - E$$

$$\frac{d}{dt}i(t) = -\frac{R}{L}i(t) + \frac{1}{L}[v(t) - E]$$

Eq. discreta geral

$$i(t+h) = Fi(t) + H[v(t) - E]$$

Definição de derivada

$$\lim_{h \to 0} \frac{i(t+h) - i(t)}{h} = \frac{d}{dt}i(t)$$

Integração Numérica - 3

Aproximação

$$\frac{i(t+h)-i(t)}{h} \simeq \frac{d}{dt}i(t) \quad \text{(para h pequeno)}$$

$$i(t+h) = i(t) + h[\frac{d}{dt}i(t)]$$

$$i(t+h) = i(t) + \left\{-\frac{R}{L}i(t) + \frac{1}{L}[v(t)-E]\right\}h$$

Eq. discreta final

$$i(t+h) = (1-\frac{R}{L}h)i(t) + \frac{h}{L}[v(t)-E]$$