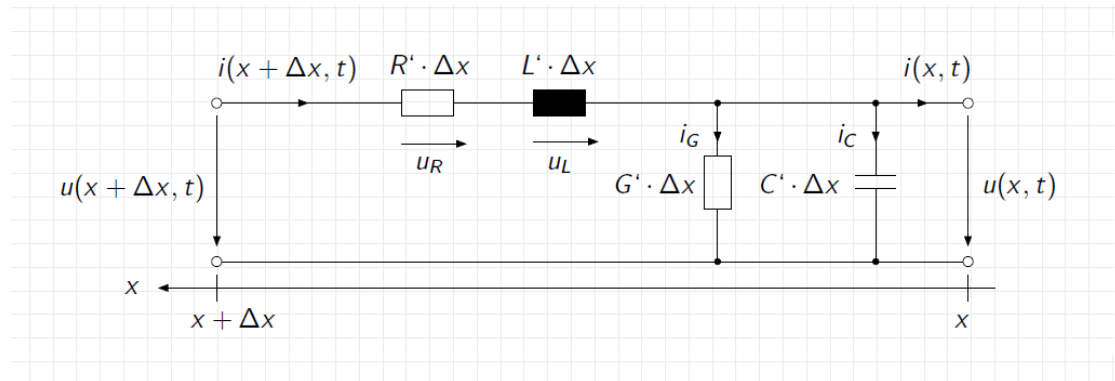# Formelsammlung Hochfrequenztechnik

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23. April 2019

1 Leitungstheorie

1.1 Leitungsmodell

Kirchhoff'sche Regel führt z.B. zu

$$u_R + u_L + u(x,t) - u(x+\Delta x, t) = 0$$

$$R' * \Delta x * i(x+\Delta x, t) + L' * \Delta x * \frac{\partial i(x+\Delta x, t)}{\partial t} + u(x,t) - u(x+\Delta x, t) = 0$$

oder

$$i(x+\Delta x, t) - i_g - i_c - i(x,t) = 0$$

$$i(x+\Delta x, t) - G' * \Delta x * u(x,t) - C' * \Delta x * \frac{\partial u(x,t)}{\partial t} - i(x,t) = 0$$

1.2 Telegraphengleichungen

$$\frac{\partial u(x,t)}{\partial x} = R' * i(x,t) + L' * \frac{\partial i(x,t)}{\partial t} \tag{1}$$

$$\frac{\partial i(x,t)}{\partial x} = G' * u(x,t) + C' * \frac{\partial u(x,t)}{\partial t} \tag{2}$$