

Fourier Series

f_o : fundamental frequency

T : fundamental period

Synthesis

$$x(t) = \sum_{k=-\infty}^{\infty} a_k e^{jk2\pi f_o t}$$

$$\begin{aligned} x(t) = & \dots + a_{-2}e^{-j4\pi f_o t} + a_{-1}e^{-j2\pi f_o t} + a_0 \\ & + a_1e^{j2\pi f_o t} + a_2e^{j4\pi f_o t} + \dots \end{aligned}$$

Analysis

$$a_k = \frac{1}{T} \int_0^T x(t) e^{-jk2\pi f_o t} dt$$

$$f_o = 1/T$$