Dagens teman

- Pulståg, sampling, periodisk fortsättning (F 5)
- Egenskaper hos fourierserietransformen (F 6)

Viktiga summationer

- $$\sum_{n=-M}^{M} e^{jn\omega t} = \frac{\sin P\omega t/2}{\sin \omega t/2}, \; P = 2M + 1$$

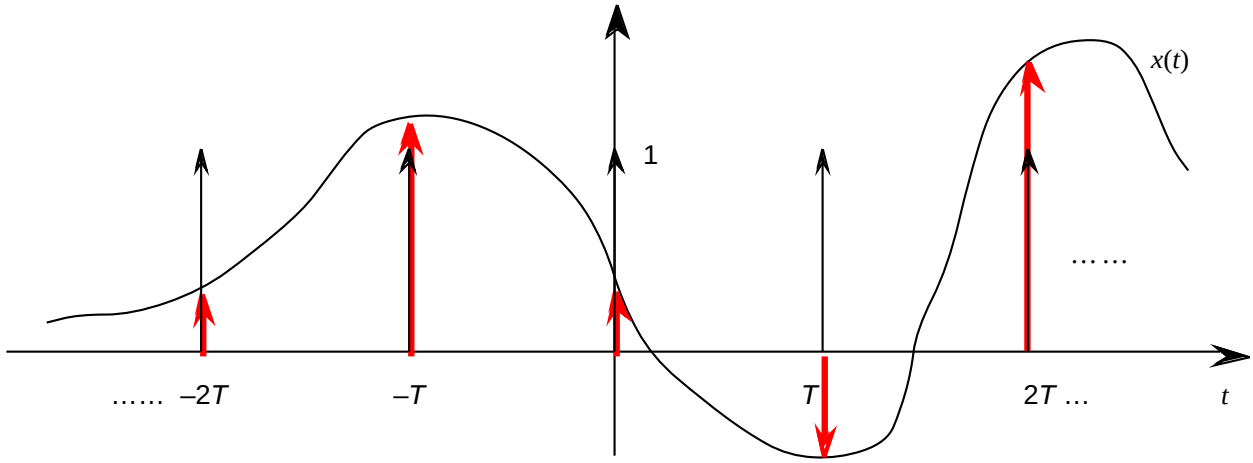
  = antalet termer

Summa av alla harmoniska signaler med heltalsfrekvenser:

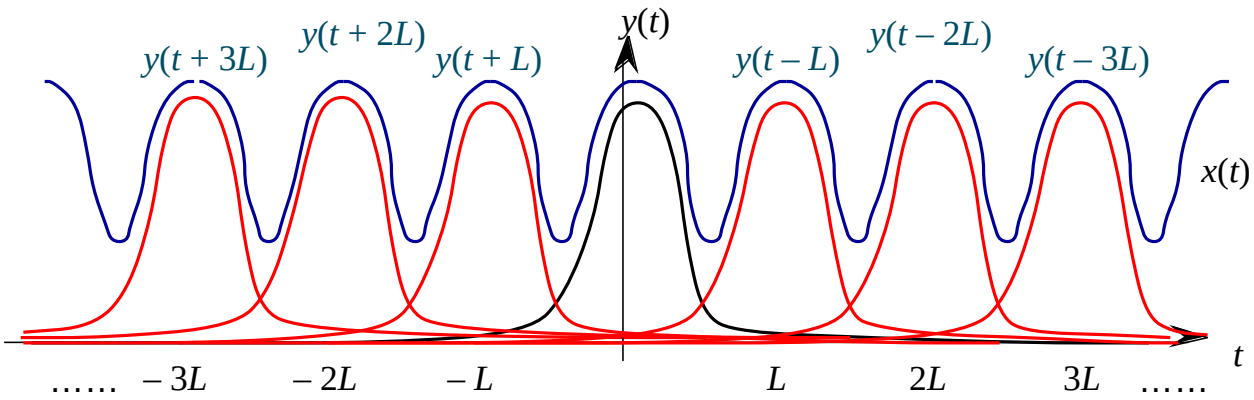
- $$\sum_{n=-\infty}^{\infty} e^{2\pi jnt} = \sum_{n=-\infty}^{\infty} \delta(t - n)$$

Generellare: Summa av alla T-periodiska harmoniska signaler

- $$\sum_{n=-\infty}^{\infty} e^{2\pi jnt/T} = T \sum_{n=-\infty}^{\infty} \delta(t - nT)$$



$$\sum_{n=-\infty}^{\infty} x(nT) \cdot \delta(t - nT) = x(t) \cdot \sum_{n=-\infty}^{\infty} \delta(t - nT)$$



$$x(t) = \sum_{n=-\infty}^{\infty} y(t - nL) \Leftrightarrow x(t) = y(t) * \sum_{n=-\infty}^{\infty} \delta(t - nL)$$

Viktiga egenskaper hos fourierserietransformen

L-periodisk funktionen	Fourierserie-koefficienter
$x(t)$ $y(t)$	c_n d_n
$C\,x(t) + D\,y(t)$, C och D konstanta	$C\,c_n + D\,d_n$
$x'(t)$	$\frac{2\pi n \mathrm{j}}{L}\,c_n$
$x''(t)$	$-\frac{4\pi^2 n^2}{L^2}\,c_n$
$x^{(m)}(t)$	$\left(\frac{2\pi n \mathrm{j}}{L}\right)^m c_n$
$x(t-a)$	$\mathrm{e}^{-2\pi n \mathrm{j} a/L} \cdot c_n$
$\sum_{n=-\infty}^{\infty} \delta(t - nL)$	$c_n = \frac{1}{L}$

Parsevals relation

$$\frac{1}{L}\oint_{\langle L\rangle} |x(t)|^2\,\mathrm{d}t = \sum_{n=-\infty}^{\infty} |c_n|^2 .$$