

C. Bølgelikn og F-transf.

$$\begin{cases} u_{tt} = c^2 u_{xx} & t > 0, x \in \mathbb{R} \\ u(x, 0) = f(x) & t = 0, x \in \mathbb{R} \\ u_t(x, 0) = 0 & t = 0, x \in \mathbb{R} \end{cases}$$

↓ F (s,j,k)

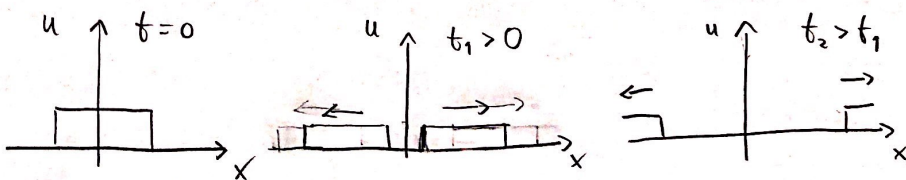
$$\begin{cases} \hat{u}_{tt} = -c^2 \omega^2 \hat{u} \\ \hat{u}(\omega, 0) = \hat{f} \\ \hat{u}_t(\omega, 0) = 0 \end{cases}$$

↓ Løs (s,j,k)

$$\begin{aligned} \hat{u}(\omega, t) &= \hat{f}(\omega) \underbrace{\cos(c\omega t)} \\ &= \frac{1}{2}(e^{ic\omega t} + e^{-ic\omega t}) \end{aligned}$$

↓ F⁻¹ (s,j,k.)

$$\underline{u(x, t) = \frac{1}{2}(f(x+ct) + f(x-ct))}$$



Ren transport - "form bevarer"