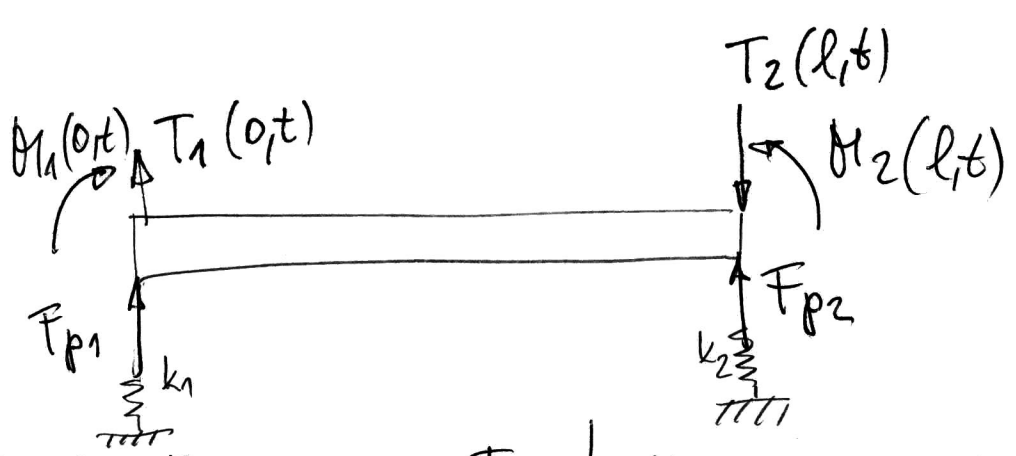

$T_1(0,t) = F_{p1}$ $\quad F_{p1} = k_1 y_1$

$T_2(l,t) = -F_{p2}$ $\quad F_{p2} = k_2 y_2$

$M_1(0,t) = 0$

$M_2(l,t) = 0$

$$a^4 = \frac{\mu l^2}{EJ}$$

rovnice přímkyové osy

$M = -EJ y''$

$T = -EJ y'''$

$$y(x) = D_1 \cosh ax + D_2 \sinh ax + D_3 \cos ax + D_4 \sin ax$$

$x = 0$:

$$y(0) = D_1 + D_3$$

$$y'(x) = D_1 a \sinh ax + D_2 a \cosh ax - D_3 a \sin ax + D_4 a \cos ax$$

$$y''(x) = D_1 a^2 \cosh ax + D_2 a^2 \sinh ax - D_3 a^2 \cos ax - D_4 a^2 \sin ax$$

$$y'''(x) = D_1 a^3 \sinh ax + D_2 a^3 \cosh ax + D_3 a^3 \sin ax - D_4 a^3 \cos ax$$

$T_1(0,t) = F_{p1} = k_1 y(0) I(t) = -EJ\, y'''(0) I(t)$

$k_1 (D_1 + D_3) = -EJ a^3 (D_2 - D_4)$

$M_1(0,t) = 0 = -EJ y''(0) I(t)$

$0 = -EJ a^2 (D_1 - D_3)$

$\rightarrow D_1 = D_3$

$$T_2(l,t) = -F_{p2} = -k_2 \cdot Y(e)T(t) = -EJ\,Y'''(e)T(t)$$

$$-k_2(D_1\cosh al + D_2\sinh al + D_3\cos al + D_4\sin al) =$$
$$= -EJ(D_1a^3\sinh al + D_2a^3\cosh al + D_3a^3\sin al - D_4a^3\cos al)$$

$$M_2(l,t) = 0 = -EJY''(0)$$

$$0 = -EJa^2(D_1\cosh al + D_2\sinh al - D_3\cos al - D_4\sin al)$$

$$\begin{bmatrix} 2k_1 & EJa^3 & -EJa^3 \\ -k_2(\cosh al + \cos al) + & -k_2\sinh al + & -k_2\sin al - \\ + EJa^3(\sinh ax + \sin ax) & + EJa^3(\cosh al)) & - EJa^3\cos al \\ \cosh al - \cos al & \sinh al & -\sin al \end{bmatrix} \begin{bmatrix} D_1 \\ D_2 \\ D_4 \end{bmatrix} = \begin{bmatrix} 0 \\ 0 \\ 0 \end{bmatrix}$$