MUD - MINIPROJEKT - LAB 02

Model linearyzowany domku:

$$\begin{cases} C_{v1}\dot{T}_{w1}(t) = cpf\,T_{kz}(t) - cpf\,T_{w1}(t) - V_s(T_{w1}(t) - T_{zew}(t)) - V_o(T_{w1}(t) - T_{w2}(t)) \\ C_{v2}\dot{T}_{w2}(t) = V_s(T_{w1}(t) - T_{w2}(t)) + cpf\,T_{w1}(t) - cpf\,T_{w2}(t) - V_s(T_{w2}(t) - T_{zew}(t)) \end{cases}$$

Wyznaczenie równań stanu:

$$\begin{cases} \dot{T}_{w1} = \frac{1}{C_{v1}}\left(-cpf\,T_{w1} - V_s T_{w1} - V_o T_{w1} + V_o T_{w2} + cpf\,T_{kz} + V_s T_{zew}\right) \\ \dot{T}_{w2} = \frac{1}{C_{v2}}\left(V_o T_{w1} + cpf\,T_{w1} - V_o T_{w2} - cpf\,T_{w2} - V_s T_{w2} + V_s T_{zew}\right) \end{cases}$$

$$\begin{cases} \dot{T}_{w1} = \frac{1}{C_{v1}}\left(T_{w1}(-cpf - V_s - V_o) + T_{w2}\cdot(V_o) + T_{kz}\cdot cpf + T_{zew}\cdot V_s\right) \\ \dot{T}_{w2} = \frac{1}{C_{v2}}\left(T_{w1}(cpf + V_o) + T_{w2}(-V_o - cpf - V_s) + V_s T_{zew}\right) \end{cases}$$

Postać macierzowa:

$$\begin{bmatrix} \dot{T}_{w1} \\ \dot{T}_{w2} \end{bmatrix} = \begin{bmatrix} \frac{-(cpf+V_s+V_o)}{C_{v1}} & \frac{V_o}{C_{v1}} \\ \frac{cpf+V_o}{C_{v2}} & \frac{-(cpf+V_s+V_o)}{C_{v2}} \end{bmatrix} \begin{bmatrix} T_{w1} \\ T_{w2} \end{bmatrix} + \begin{bmatrix} \frac{cpf}{C_{v1}} & \frac{V_s}{C_{v1}} \\ 0 & \frac{V_s}{C_{v2}} \end{bmatrix} \begin{bmatrix} T_{kz} \\ T_{zew} \end{bmatrix}$$

wektor pochodnych zmiennych stanu — macierz stanu — wektor zmiennych stanu — macierz wejść — wektor wejść