

()

[1-3].

()

ΔP

()

(20 /).

[4]

« »,

0,85 - 0,9.

2,

10

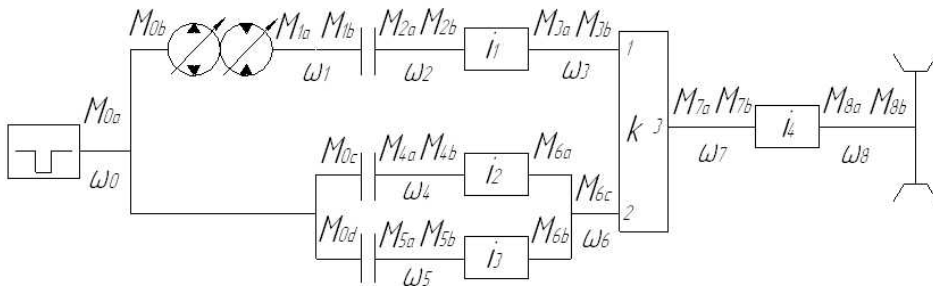
0,3 ,
20 /

10 /

[4]

70 ³,

2



ω_j - ; i_j - ; M_{nm} -
 ; k - ; m ; n - ,
 . 1

- : $i_1 = 0,27$, $i_2 = 0,21$, $i_3 = 0,49$, $i_4 = 0,206$;
- : $k = -1,2$.

[5]

[5]

[4],

(2)

[4]

2

[6, 7].

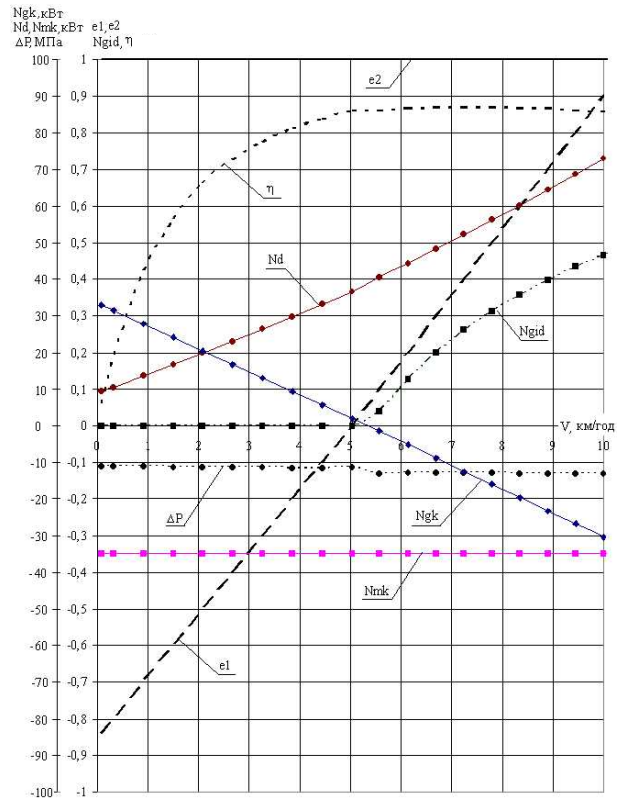
Simulink

Matlab.

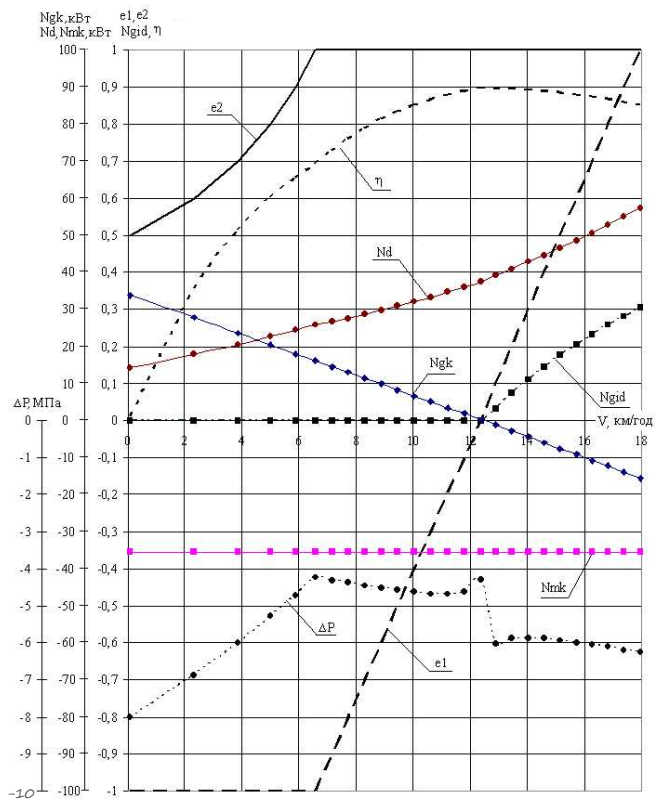
2 ():

$$\left\{ \begin{array}{l}
\omega_0 = \omega_d; \\
\mathbf{e}_1 \cdot \mathbf{q}_1 \cdot \omega_0 - \mathbf{e}_2 \cdot \mathbf{q}_2 \cdot \omega_1 = \gamma \cdot \Delta Q + \frac{\Delta P \cdot V_{0*}}{2 \cdot \pi \cdot E (g^*)} \cdot (|\omega_{00}| + |\omega_{01}|); \\
\Delta Q = \left(\frac{K_{1y}}{\mu} \cdot (1 + C_{1y} \cdot |\omega_{00}|) + \frac{K_{2y}}{\mu} \cdot (1 + C_{2y} \cdot |\omega_{01}|) \right) \cdot \Delta P; \\
\omega_1 - \omega_2 = 0; \omega_2 \cdot i_1 - \omega_3 = 0; \omega_0 - \omega_4 = 0, Y = 1; \omega_4 \cdot i_2 - \omega_6 = 0; \\
\omega_0 - \omega_5 = 0, Y = 0; \omega_5 \cdot i_3 - \omega_6 = 0; \omega_3 - k \cdot \omega_6 + (k - 1) \cdot \omega_7 = 0; \\
\omega_7 \cdot i_4 - \omega_8 = 0; M_{0b} - \mathbf{e}_1 \cdot \mathbf{q}_1 \cdot \Delta P = -\Delta M_1 \cdot \text{sgn}(\omega_{00}); \\
\Delta M_1 = q_1 \cdot \left[\bar{K}_1 \cdot |\omega_{00}| \cdot (1 + \bar{K}_2 \cdot \bar{\mathbf{e}}_1^2) + \frac{\bar{K}_5 \cdot (1 + \bar{K}_4 \cdot |\bar{\mathbf{e}}_1|)}{(1 + \bar{K}_3 \cdot |\omega_{00}| \cdot D_{q1})} \cdot \Delta P_0 + \right. \\
\left. + \frac{\bar{K}_8 \cdot (1 + \bar{K}_7 \cdot |\bar{\mathbf{e}}_1|)}{(1 + \bar{K}_6 \cdot |\omega_{00}| \cdot D_{q1})} \right]; \\
D_{q1} = \sqrt[3]{2 \cdot \pi \cdot q_1}; M_{1a} + \mathbf{e}_2 \cdot q_2 \cdot \Delta P = -\Delta M_2 \cdot \text{sgn}(\omega_{01}); \\
\Delta M_2 = q_2 \cdot \left[\bar{K}_1 \cdot |\omega_{01}| \cdot (1 + \bar{K}_2 \cdot \bar{\mathbf{e}}_2^2) + \frac{\bar{K}_5 \cdot (1 + \bar{K}_4 \cdot |\bar{\mathbf{e}}_2|)}{(1 + \bar{K}_3 \cdot |\omega_{01}| \cdot D_{q2})} \cdot \Delta P_0 + \right. \\
\left. + \frac{\bar{K}_8 \cdot (1 + \bar{K}_7 \cdot |\bar{\mathbf{e}}_2|)}{(1 + \bar{K}_6 \cdot |\omega_{01}| \cdot D_{q2})} \right]; \\
D_{q2} = \sqrt[3]{2 \cdot \pi \cdot q_2}; M_{1b} + M_{2a} = 0; M_{2b} \cdot \eta_1^{\ominus \cdot \text{sgn}(N_{2b})} + i_1 \cdot M_{3a} = 0; \\
M_{0c} + M_{4a} = 0, Y = 1; M_{0d} = M_{5a} = 0, Y = 1; \\
M_{4b} \cdot \eta_2^{\ominus \cdot \text{sgn}(N_{4b})} + i_2 \cdot M_{6a} = 0; \\
M_{0d} + M_{5a} = 0, Y = 0; M_{0c} = M_{4a} = 0, Y = 0; \\
M_{5b} \cdot \eta_3^{\ominus \cdot \text{sgn}(N_{5b})} + i_3 \cdot M_{6b} = 0; \\
M_{3b} \cdot \eta_{13}^{\ominus \cdot \text{sgn}(N_{3b})} + M_{6c} \cdot \eta_{23}^{\ominus \cdot \text{sgn}(N_{6c})} + M_{7a} = 0; \\
M_{3b} \cdot k \cdot \eta_{13}^{\ominus \cdot \text{sgn}(N_{3b})} + M_{6c} \cdot \eta_{23}^{\ominus \cdot \text{sgn}(N_{6c})} = 0; \\
M_{7b} \cdot \eta_4^{\ominus \cdot \text{sgn}(N_{7b})} + i_4 \cdot M_{8a} = 0; \\
M_{8b} - G \cdot f \cdot r = 0; M_{0a} + M_{0b} + M_{0c} + M_{0d} = 0; \\
M_{1a} + M_{1b} = 0; M_{2a} + M_{2b} = 0; M_{3a} + M_{3b} = 0; \\
M_{4a} + M_{4b} = 0; M_{5a} + M_{5b} = 0; M_{6a} + M_{6b} + M_{6c} = 0; \\
M_{7a} + M_{7b} = 0; M_{8a} + M_{8b} = 0,
\end{array} \right.$$

$\omega_j -$; $i_j -$; $\omega_d -$; $k -$
; $e_1, e_2 -$
; $q_1, q_2 -$; $\gamma -$
, ($\gamma = 1 -$
; $\gamma = -1 -$); $\Delta Q -$
; $\Delta P -$; $V_{0*} -$,
; $E(g^*) -$,
 g^* ; $\omega_{02}, \omega_{00} -$ ($\omega_{02} -$
, $\omega_{00} -$,
),
0; $\omega_{03}, \omega_{01} -$ ($\omega_{03} -$
, $\omega_{01} -$,
),
, 0; $K_{iy}, C_{iy} -$
($i = 1$) ($i = 2$); $\mu -$
, ; $Y -$,
($Y = 1 -$, $Y = 0 -$); $M_{nm} -$
; $m -$, ; $n -$
; $\Theta -$; $\eta_j -$
, $\Theta = -1$ ($\Theta = 0 -$);
 $N_{nm} -$, ; $\eta_{13}, \eta_{23} -$
; $\Delta M_1, \Delta M_2 -$;
 $\bar{K}_1, \bar{K}_2, \dots, \bar{K}_8 -$; $D_{qi} -$
; $\Delta P_0 -$,
0; $G -$; $r -$
; $f -$.
2
.3, : $V -$; $\eta -$; $M -$
; $N_d -$; $N_1 -$
; $N_2 -$, ; $N_{gk} -$
; $N_{mk} -$
; $N_{gid} -$



. 2



. 3

• 2 :
 • 2 18 / . -
 - , -
 1 2 2 -
 1 1 -
 , -
 , 18 / -
 ; -
 • 2
 -455,10 / (-192,70 / -
 «PSM-HYDRAYLIKS» -
 460,0 /c); -
 • 2 -
 , $\mu_1=0,1$, -
 ;
 • 2
 0,870, -0,899; -
 • 2
 -13,24, -8,01 (-
 «PSM-HYDRAYLIKS» -
 40,0); -
 • 2
 210,00 / (, «PSM-HYDRAYLIKS» -
 460,0 /c). -
 • , -
 » « -
 • , , -
 , , -
 , , -
 • 2, « -
 », $\mu_1=0,1$, -
 , « », -
 [1].

