

$$\Delta = \det(C) - \text{миноры СЛАУ}$$

$$\Delta = 1,774 \cdot 10^{-11} \theta^4 - 0,000029 \theta^2 + 1 \quad \left. \begin{array}{l} \Delta_1 = -5,56 \cdot 10^{-14} \theta^4 - 7,6 \cdot 10^{-9} \theta^2 \\ \Delta_2 = 1,48 \cdot 10^{-8} \theta^2 - 1,809 \cdot 10^{-14} \theta^4 \end{array} \right\} \text{список в конце}$$

$$\Delta_1 = -5,56 \cdot 10^{-14} \theta^4 - 7,6 \cdot 10^{-9} \theta^2$$

$$\Delta_2 = 1,48 \cdot 10^{-8} \theta^2 - 1,809 \cdot 10^{-14} \theta^4$$

$$D_1 = \frac{\Delta_1}{\Delta} = \frac{-5,56 \cdot 10^{-14} \theta^4 - 7,6 \cdot 10^{-9} \theta^2}{1,774 \cdot 10^{-11} \theta^4 - 0,000029 \theta^2 + 1}$$

$$D_2 = \frac{\Delta_2}{\Delta} = \frac{1,48 \cdot 10^{-8} \theta^2 - 1,809 \cdot 10^{-14} \theta^4}{1,774 \cdot 10^{-11} \theta^4 - 0,000029 \theta^2 + 1}$$

$$\omega_1 = \frac{1}{\sqrt{\frac{m_1 \delta_{11} + m_2 \delta_{22}}{2} + \sqrt{\left(\frac{m_1 \delta_{11} - m_2 \delta_{22}}{2}\right)^2 + m_1 m_2 \delta_{12} \delta_{22}}} \quad \text{③}$$

$$\text{③} \left| \begin{array}{l} m_1 = 8,3 \\ m_2 = 37,8 \\ \delta_{11} = 3,8 \cdot 10^{-7} \\ \delta_{22} = 6,9 \cdot 10^{-7} \\ \delta_{12} = -4,4 \cdot 10^{-7} \end{array} \right| = 186,92 \frac{\text{рад}}{\text{с}}$$

$$\omega_2 = \frac{1}{\sqrt{\frac{m_1 \delta_{11} + m_2 \delta_{22}}{2} - \sqrt{\left(\frac{m_1 \delta_{11} - m_2 \delta_{22}}{2}\right)^2 + m_1 m_2 \delta_{12} \delta_{21}}} \quad \text{④}$$

$$\text{④} \quad 1275,38 \frac{\text{рад}}{\text{с}}$$

$$n_1 = \frac{60 \omega_1}{2\pi} = 1,785 \cdot 10^3 \frac{\text{об}}{\text{мин}}; \quad n_2 = \frac{60 \omega_2}{2\pi} = 12,179 \cdot 10^3 \frac{\text{об}}{\text{мин}}$$

Первая форма колебаний:

$$\theta = \omega_1 = 186,92 \frac{\text{рад}}{\text{с}}$$

$$R_I = \begin{pmatrix} D_1/\omega_1 \\ D_2/\omega_1 \end{pmatrix} = \begin{pmatrix} +0,0386 \\ 0,057 \end{pmatrix}$$

Вторая:

$$\theta = \omega_2 = 1275,38 \frac{\text{рад}}{\text{с}}$$

$$R_{II} = \begin{pmatrix} D_1/\omega_2 \\ D_2/\omega_2 \end{pmatrix} = \begin{pmatrix} -0,21 \\ 0,59 \end{pmatrix}$$