Supplementary Materials

Constants of considered problem:

In the case: $a^2 - 4b > 0$, constants are:

$$r_1 = \frac{1}{2}\left(a + \sqrt{a^2 - 4b}\right),\ r_2 = \frac{1}{2}\left(a - \sqrt{a^2 - 4b}\right),\ \delta_1 = +\sqrt{r_1},\ \delta_2 = -\sqrt{r_1},\ \delta_3 = +\sqrt{r_2},\ \delta_4 = -\sqrt{r_2},$$

$$\Im_1 = \frac{1}{E}\left(\frac{B^*}{A} - D^*\right),\ \Im_2 = \frac{1}{EA},\ \mathscr{D}_i = \delta_i\left(\Im_1 - \delta_i^2 \Im_2\right) \quad i = 1,2,3,4,$$

$$C_1 = -\frac{1}{\mathscr{D}_1}\left(\mathscr{D}_2 C_2 + \mathscr{D}_3 C_3 + \mathscr{D}_4 C_4\right),\quad C_2 = -\frac{1}{\Re_1}\left(\Re_2 C_3 + \Re_3 C_4\right),$$

$$C_3 = -\frac{1}{S_1}\left(S_2 C_4 + \frac{d}{b}\right),\ C_4 = \frac{\mathscr{T}_1 - S_1}{\mathscr{T}_2 S_1 - \mathscr{T}_1 S_2}\frac{d}{b},$$

$$\mathscr{M}_i = 1 - \frac{\mathscr{D}_{i+1}}{\mathscr{D}_1} \quad i = 1,2,3,\ \mathscr{N}_i = \exp\delta_{i+1} - \frac{\mathscr{D}_{i+1}}{\mathscr{D}_1}\exp\delta_1 \quad i = 1,2,3,\ \Re_i = \mathscr{D}_{i+1}\left(\exp\delta_{i+1} - \exp\delta_1\right) \quad i = 1,2,3,$$

$$\mathscr{T}_i = \mathscr{N}_{i+1} - \frac{\mathscr{N}_1}{\Re_1}\Re_{i+1} \quad i = 1,2,\ S_i = \mathscr{M}_{i+1} - \frac{\mathscr{M}_1}{\Re_1}\Re_{i+1} \quad i = 1,2,$$

$$\begin{aligned}
{}^{1}\mathscr{B}_1 = {} & \frac{{}^{1}C}{4\delta_1^2} + \frac{{}^{2}C}{4\delta_2^2} + \frac{{}^{3}C}{4\delta_3^2} + \frac{{}^{4}C}{4\delta_4^2} + \frac{{}^{2}D}{\left(\delta_1 + \delta_3\right)^2} + \frac{{}^{3}D}{\left(\delta_1 + \delta_4\right)^2} + \\
& + \frac{{}^{1}E}{\left(\delta_2 + \delta_3\right)^2} + \frac{{}^{2}E}{\left(\delta_2 + \delta_4\right)^2} + \frac{{}^{1}F}{\delta_1^2} + \frac{{}^{2}F}{\delta_2^2} + \frac{{}^{3}F}{\delta_3^2} + \frac{{}^{4}F}{\delta_4^2},
\end{aligned}$$

$$\begin{aligned}
{}^{1}\mathscr{B}_2 = {} & \frac{1}{4\delta_1^2}\,{}^{1}C\exp\left(2\delta_1\right) + \frac{1}{4\delta_2^2}\,{}^{2}C\exp\left(2\delta_2\right) + \frac{1}{4\delta_3^2}\,{}^{3}C\exp\left(2\delta_3\right) + \frac{1}{4\delta_4^2}\,{}^{4}C\exp\left(2\delta_4\right) + \\
& + \frac{1}{2}\,{}^{1}D + \frac{{}^{2}D}{\left(\delta_1 + \delta_3\right)^2}\exp\left(\delta_1 + \delta_3\right) + \frac{{}^{3}D}{\left(\delta_1 + \delta_4\right)^2}\exp\left(\delta_1 + \delta_4\right) + \frac{{}^{1}E}{\left(\delta_2 + \delta_3\right)^2}\exp\left(\delta_2 + \delta_3\right) + \\
& + \frac{{}^{2}E}{\left(\delta_2 + \delta_4\right)^2}\exp\left(\delta_2 + \delta_4\right) + \frac{1}{2}\,{}^{3}E + \frac{1}{\delta_1^2}\,{}^{1}F\exp\left(\delta_1\right) + \frac{1}{\delta_2^2}\,{}^{2}F\exp\left(\delta_2\right) + \frac{1}{\delta_3^2}\,{}^{3}F\exp\left(\delta_3\right) + \\
& + \frac{1}{\delta_4^2}\,{}^{4}F\exp\left(\delta_4\right) + \frac{1}{2}\,{}^{5}F,
\end{aligned}$$

$${}^{1}H_2 = -{}^{1}\mathscr{B}_1,\ {}^{1}H_1 = {}^{1}\mathscr{B}_1 - {}^{1}\mathscr{B}_2 - \frac{1}{\Pr Ec},$$

$$ {}^{i}C = C_i^2\left[(1+K)\delta_i^2 + \left(Ha^2+R\right)\right] \quad i=1,2,3,4,\ \ {}^{i}D = 2C_1C_{i+1}\left[(1+K)\delta_1\delta_{i+1} + \left(Ha^2+R\right)\right] \quad i=1,2,3, $$

$$ {}^{i}E = 2C_2C_{i+2}\left[(1+K)\delta_2\delta_{i+2} + \left(Ha^2+R\right)\right] \quad i=1,2,\ \ {}^{3}E = 2C_3C_4\left[(1+K)\delta_3\delta_4 + \left(Ha^2+R\right)\right], $$

$$ {}^{i}F = 2\frac{d}{b}\left(Ha^2+R\right)C_i \quad i=1,2,3,4,\ \ {}^{5}F = \frac{d^2}{b^2}\left(Ha^2+R\right). $$

In the case: $a^2-4b=0,$ constants are:

$$ r_1 = \frac{1}{2}\left(a+\sqrt{a^2-4b}\right),\ \ r_2 = \frac{1}{2}\left(a-\sqrt{a^2-4b}\right),\ \ \xi_1 = \sqrt{\frac{1}{2}a},\ \ \xi_2 = -\sqrt{\frac{1}{2}a}, $$

$$ \Im_1 = \frac{1}{E}\left(\frac{B^*}{A} - D^*\right),\ \ \Im_2 = \frac{1}{EA}, $$

$$ C_5 = -\left(C_7 + \frac{d}{b}\right),\ \ C_6 = \frac{1}{F_1}\left(E_4 - E_3C_7 - F_2C_8\right),\ \ C_7 = -\frac{1}{E_7}\left(E_8C_8 + E_9\right),\ \ C_8 = \frac{E_9E_{10} - E_7E_{12}}{E_7E_{11} - E_8E_{10}}, $$

$$ F_i = \Im_1 - 3\Im_2\xi_i^2 \quad i=1,2,\ \ E_i = \xi_i\left(\Im_1 - \Im_2\xi_i^2\right) \quad i=1,2, $$

$$ G_i = \xi_i\left(\Im_1 - \xi_i^2\Im_2\right)\exp\xi_i \quad i=1,2,\ \ H_i = [\Im_1\left(1+\xi_i\right) - \Im_2\xi_i^2\left(3+\xi_i\right)]\exp\xi_i \quad i=1,2, $$

$$ E_3 = E_2 - E_1,\ \ E_4 = E_1\frac{d}{b},\ \ E_5 = \exp\xi_2 - \exp\xi_1,\ E_6 = \left(1-\exp\xi_1\right)\frac{d}{b},\ \ G_3 = G_2 - G_1,\ \ G_4 = G_1\frac{d}{b}, $$

$$ E_7 = E_5 - \frac{E_3}{F_1}\exp\xi_1,\ \ E_8 = \exp\xi_2 - \frac{F_2}{F_1}\exp\xi_1,\ \ E_9 = E_6 + \frac{E_4}{F_1}\exp\xi_1,\ \ E_{10} = G_3 - \frac{H_1}{F_1}E_3,\ E_{11} = H_2 - \frac{H_1}{F_1}F_2, $$

$$ E_{12} = \frac{H_1}{F_1}E_4 - G_4,\ \ E_{13} = E_1C_5 + F_1C_6,\ \ E_{14} = E_1C_6,\ \ E_{15} = E_2C_7 + F_2C_8,\ \ E_{16} = E_2C_8, $$

$$ {}^{2}\mathcal{B}_1 = \Omega_{28} + \Omega_{31} + \Omega_{34}{}^{*} + \Omega_{36}{}^{*}, $$

$$ \begin{aligned} {}^{2}\mathcal{B}_2 &= \left(\Omega_{28} + \Omega_{29} + \Omega_{30}\right)\exp\left(2\xi_1\right) + \left(\Omega_{31} + \Omega_{32} + \Omega_{33}\right)\exp\left(2\xi_2\right) + \\ &+ \left(\Omega_{34}{}^{*} + \Omega_{35}{}^{*}\right)\exp\left(\xi_1\right) + \left(\Omega_{36}{}^{*} + \Omega_{37}{}^{*}\right)\exp\left(\xi_2\right) + \Omega_{38}{}^{*} + \Omega_{39}{}^{*} + \Omega_{40}{}^{*}, \end{aligned} $$

$$ {}^{2}H_1 = {}^{2}\mathcal{B}_1 - {}^{2}\mathcal{B}_2 - \frac{1}{\Pr Ec},\ \ {}^{2}H_2 = -{}^{2}\mathcal{B}_1, $$

$$ \Omega_1 = (1+K)\left(C_6^2 + \xi_1^2C_5^2 + 2C_5C_6\xi_1\right) + \left(Ha^2+R\right)C_5^2,\ \ \Omega_2 = (1+K)\left(2C_5C_6\xi_1^2 + 2\xi_1C_6^2\right) + 2\left(Ha^2+R\right)C_5C_6, $$

$$\Omega_3 = (1+K)\left(\xi_1^2 C_6^2 + \left(Ha^2+R\right)C_6^2\right),\ \Omega_4 = (1+K)\left(C_8^2 + \xi_2^2 C_7^2 + 2\xi_2 C_7 C_8\right) + C_7^2\left(Ha^2+R\right),$$

$$\Omega_5 = (1+K)\left(2C_7C_8\xi_2^2 + 2\xi_2 C_8^2\right) + 2C_7C_8\left(Ha^2+R\right),\ \Omega_6 = (1+K)\xi_2^2 C_8^2 + C_8^2\left(Ha^2+R\right),$$

$$\Omega_7 = (1+K)\left(2C_6C_8 + 2C_6C_7\xi_2 + 2C_5C_8\xi_1 + 2\xi_1\xi_2C_5C_7\right) + 2C_5C_7\left(Ha^2+R\right),$$

$$\Omega_8 = (1+K)\left(2C_6C_8\xi_2 + 2C_6C_8\xi_1 + 2\xi_1\xi_2C_6C_7 + 2\xi_1\xi_2C_5C_8\right) + 2\left(Ha^2+R\right)\left(C_6C_7 + C_5C_8\right),$$

$$\Omega_9 = (1+K)2\xi_1\xi_2C_6C_8 + 2C_6C_8\left(Ha^2+R\right),\ \Omega_{10} = 2\frac{d}{b}\left(Ha^2+R\right)C_5,\ \Omega_{11} = 2\frac{d}{b}\left(Ha^2+R\right)C_6,$$

$$\Omega_{12} = 2\frac{d}{b}\left(Ha^2+R\right)C_7,\ \Omega_{13} = 2\frac{d}{b}\left(Ha^2+R\right)C_8,\ \Omega_{14} = \frac{d^2}{b^2}\left(Ha^2+R\right),\ \Omega_{15} = \frac{\Omega_1}{2\xi_1} - \frac{\Omega_2}{4\xi_1^2} + \frac{\Omega_3}{4\xi_1^3},$$

$$\Omega_{16} = \frac{\Omega_2}{2\xi_1} - \frac{\Omega_3}{2\xi_1^2},\ \Omega_{17} = \frac{\Omega_3}{2\xi_1},\ \Omega_{18} = \frac{\Omega_4}{2\xi_2} - \frac{\Omega_5}{4\xi_2^2} + \frac{\Omega_6}{4\xi_2^3},\ \Omega_{19} = \frac{\Omega_5}{2\xi_2} - \frac{\Omega_6}{2\xi_2^2},\ \Omega_{20} = \frac{\Omega_6}{2\xi_2},\ \Omega_{21}{}^* = \frac{\Omega_{10}}{\xi_1} - \frac{\Omega_{11}}{\xi_1^2},$$

$$\Omega_{22}{}^* = \frac{\Omega_{11}}{\xi_1},\ \Omega_{23}{}^* = \frac{\Omega_{12}}{\xi_2} - \frac{\Omega_{13}}{\xi_2^2},\ \Omega_{24}{}^* = \frac{\Omega_{13}}{\xi_2},\ \Omega_{25} = \frac{\Omega_{11}}{\xi_1},\ \Omega_{26} = \frac{\Omega_{12}}{\xi_2} - \frac{\Omega_{13}}{\xi_2^2},\ \Omega_{27} = \frac{\Omega_{13}}{\xi_2},$$

$$\Omega_{28} = \frac{\Omega_{15}}{2\xi_1} - \frac{\Omega_{16}}{4\xi_1^2} + \frac{\Omega_{17}}{4\xi_1^3},\ \Omega_{29} = \frac{\Omega_{16}}{2\xi_1} - \frac{\Omega_{17}}{2\xi_1^2},\ \Omega_{30} = \frac{\Omega_{17}}{2\xi_1},\ \Omega_{31} = \frac{\Omega_{18}}{2\xi_2} - \frac{\Omega_{19}}{4\xi_2^2} + \frac{\Omega_{20}}{4\xi_2^3},\ \Omega_{32} = \frac{\Omega_{19}}{2\xi_2} - \frac{\Omega_{20}}{2\xi_2^2},$$

$$\Omega_{33} = \frac{\Omega_{20}}{2\xi_2},\ \Omega_{34}{}^* = \frac{\Omega_{21}{}^*}{\xi_1} - \frac{\Omega_{22}{}^*}{\xi_1^2},\ \Omega_{35}{}^* = \frac{\Omega_{22}{}^*}{\xi_1},\ \Omega_{36}{}^* = \frac{\Omega_{23}{}^*}{\xi_2} - \frac{\Omega_{24}{}^*}{\xi_2^2},\ \Omega_{37}{}^* = \frac{\Omega_{24}{}^*}{\xi_2},\ \Omega_{38}{}^* = \frac{\Omega_7 + \Omega_{14}}{2},$$

$$\Omega_{39}{}^* = \frac{\Omega_8}{6},\ \Omega_{40}{}^* = \frac{\Omega_9}{12}.$$

In the case: $a^2 - 4b < 0$, constants are:

$$r^*{}_1 = \frac{1}{2}\left(a + i\sqrt{4b - a^2}\right),\ r^*{}_2 = \frac{1}{2}\left(a - i\sqrt{4b - a^2}\right),\ \alpha = \frac{1}{2}a,\ \beta = \frac{1}{2}\sqrt{4b - a^2},\ R = \sqrt{\alpha^2 + \beta^2},$$

$$\alpha_1 = \sqrt{R}\cos\frac{\theta_1}{2},\ \beta_1 = \sqrt{R}\sin\frac{\theta_1}{2},\ \theta_1 = arctg\,\frac{\beta}{\alpha},$$

$$\Im_1 = \frac{1}{E}\left(\frac{B^*}{A} - D^*\right),\ \Im_2 = \frac{1}{EA},$$

$$\eta_1 = \alpha_1 + i\beta_1,\ \eta_2 = -\alpha_1 - i\beta_1,\ \eta_3 = \alpha_1 - i\beta_1,\ \eta_4 = -\alpha_1 + i\beta_1,$$

$$
{}^{3}\mathcal{B}_1 = [\frac{1}{2\alpha_1}\Omega_{45} + \frac{1}{2}\left(\Omega_{47}\chi_1 - \Omega_{49}\chi_2\right)] + [\frac{1}{2\alpha_1}\Omega_{46} - \frac{1}{2}\left(\Omega_{48}\chi_1 + \Omega_{50}\chi_2\right)] -
$$

$$
- \frac{1}{2\beta_1}\Omega_{52} + \left(\Omega_{53}\chi_1 - \Omega_{55}\chi_2\right) + \left(\Omega_{54}\chi_1 - \Omega_{56}\chi_2\right),
$$

$$
{}^{3}\mathcal{B}_2 = [\frac{1}{2\alpha_1}\Omega_{45} + \frac{1}{2}\left(\chi_1\Omega_{47} - \chi_2\Omega_{49}\right)\cos\left(2\beta_1\right) + \frac{1}{2}\left(\chi_2\Omega_{47} + \chi_1\Omega_{49}\right)\sin\left(2\beta_1\right)]\exp\left(2\alpha_1\right) +
$$

$$
+ [\frac{1}{2\alpha_1}\Omega_{46} - \frac{1}{2}\left(\chi_1\Omega_{48} + \chi_2\Omega_{50}\right)\cos\left(2\beta_1\right) + \frac{1}{2}\left(\chi_2\Omega_{48} - \chi_1\Omega_{50}\right)\sin\left(2\beta_1\right)]\exp\left(-2\alpha_1\right) -
$$

$$
- \frac{1}{2\beta_1}\Omega_{51}\sin\left(2\beta_1\right) - \frac{1}{2\beta_1}\Omega_{52}\cos\left(2\beta_1\right) + [\left(\Omega_{53}\chi_1 - \Omega_{55}\chi_2\right)\cos\left(\beta_1\right) +
$$

$$
+ \left(\Omega_{53}\chi_2 + \Omega_{55}\chi_1\right)\sin\left(\beta_1\right)]\exp\left(\alpha_1\right) + [\left(\Omega_{54}\chi_1 - \Omega_{56}\chi_2\right)\cos\left(\beta_1\right) -
$$

$$
- \left(\Omega_{54}\chi_2 + \Omega_{56}\chi_1\right)\sin\left(\beta_1\right)]\exp\left(-\alpha_1\right) + \frac{1}{2}\Omega_{57},
$$

$$
\Omega_{41} = \alpha_1 C_{10} - \beta_1 C_9,\ \ \Omega_{42} = \beta_1 C_{10} + \alpha_1 C_9,\ \ \Omega_{43} = \beta_1 C_{12} - \alpha_1 C_{11},\ \ \Omega_{44} = \alpha_1 C_{12} + \beta_1 C_{11},
$$

$$
\Omega_{45} = \frac{1}{4\alpha_1}\left[\left(1+K\right)\left(\Omega_{41}^2 + \Omega_{42}^2\right) + \left(Ha^2 + R\right)\left(C_9^2 + C_{10}^2\right)\right],
$$

$$
\Omega_{46} = \frac{1}{4\alpha_1}\left[\left(1+K\right)\left(\Omega_{43}^2 + \Omega_{44}^2\right) + \left(Ha^2 + R\right)\left(C_{11}^2 + C_{12}^2\right)\right],
$$

$$
\Omega_{47} = \frac{1}{4}\frac{\alpha_1}{\alpha_1^2 + \beta_1^2}\left[\left(1+K\right)\left(\Omega_{42}^2 - \Omega_{41}^2\right) + \left(Ha^2 + R\right)\left(C_9^2 - C_{10}^2\right)\right] - \frac{1}{2}\frac{\beta_1}{\alpha_1^2 + \beta_1^2}\left[\left(1+K\right)\Omega_{41}\Omega_{42} + \left(Ha^2 + R\right)C_9 C_{10}\right],
$$

$$
\Omega_{48} = \frac{1}{4}\frac{\alpha_1}{\alpha_1^2 + \beta_1^2}\left[\left(1+K\right)\left(\Omega_{44}^2 - \Omega_{43}^2\right) + \left(Ha^2 + R\right)\left(C_{12}^2 - C_{11}^2\right)\right] + \frac{1}{2}\frac{\beta_1}{\alpha_1^2 + \beta_1^2}\left[\left(1+K\right)\Omega_{43}\Omega_{44} - \left(Ha^2 + R\right)C_{11} C_{12}\right],
$$

$$
\Omega_{49} = \frac{1}{2}\frac{\alpha_1}{\alpha_1^2 + \beta_1^2}\left[\left(1+K\right)\Omega_{41}\Omega_{42} + \left(Ha^2 + R\right)C_9 C_{10}\right] + \frac{1}{4}\frac{\beta_1}{\alpha_1^2 + \beta_1^2}\left[\left(1+K\right)\left(\Omega_{42}^2 - \Omega_{41}^2\right) + \left(Ha^2 + R\right)\left(C_9^2 - C_{10}^2\right)\right],
$$

$$
\Omega_{50} = \frac{1}{2}\frac{\alpha_1}{\alpha_1^2 + \beta_1^2}\left[\left(1+K\right)\Omega_{43}\Omega_{44} - \left(Ha^2 + R\right)C_{11} C_{12}\right] + \frac{1}{4}\frac{\beta_1}{\alpha_1^2 + \beta_1^2}\left[\left(1+K\right)\left(\Omega_{43}^2 - \Omega_{44}^2\right) + \left(Ha^2 + R\right)\left(C_{11}^2 - C_{12}^2\right)\right],
$$

$$
\Omega_{51} = \frac{1}{2\beta_1}\left[\left(1+K\right)\left(\Omega_{41}\Omega_{43} - \Omega_{42}\Omega_{44}\right) + \left(Ha^2 + R\right)\left(C_9 C_{12} + C_{10} C_{11}\right)\right],
$$

$$
\Omega_{52} = \frac{1}{2\beta_1}\left[\left(1+K\right)\left(\Omega_{42}\Omega_{43} - \Omega_{41}\Omega_{44}\right) + \left(Ha^2 + R\right)\left(C_9 C_{11} - C_{10} C_{12}\right)\right],
$$

$$
\Omega_{53} = 2\frac{d}{b}\left(Ha^2 + R\right)\left(C_9\frac{\alpha_1}{\alpha_1^2 + \beta_1^2} - C_{10}\frac{\beta_1}{\alpha_1^2 + \beta_1^2}\right),\ \ \Omega_{54} = 2\frac{d}{b}\left(Ha^2 + R\right)\left(C_{11}\frac{\alpha_1}{\alpha_1^2 + \beta_1^2} + C_{12}\frac{\beta_1}{\alpha_1^2 + \beta_1^2}\right),
$$

$$\Omega_{55}=2\frac{d}{b}\left(Ha^2+R\right)\left(C_9\frac{\beta_1}{\alpha_1^2+\beta_1^2}+C_{10}\frac{\alpha_1}{\alpha_1^2+\beta_1^2}\right),\ \Omega_{56}=2\frac{d}{b}\left(Ha^2+R\right)\left(C_{11}\frac{\beta_1}{\alpha_1^2+\beta_1^2}-C_{12}\frac{\alpha_1}{\alpha_1^2+\beta_1^2}\right),$$

$$\Omega_{57}=\left(1+K\right)\left(\Omega_{42}\Omega_{43}-\Omega_{41}\Omega_{44}\right)+\left(Ha^2+R\right)\left(C_9C_{11}+C_{10}C_{12}+\frac{d^2}{b^2}\right),$$

$$\chi_1=\frac{\alpha_1}{\alpha_1^2+\beta_1^2},\ \chi_2=\frac{\beta_1}{\alpha_1^2+\beta_1^2},$$

$$P=\left(\Im_1-\Im_2\alpha_1^2+3\Im_2\beta_1^2\right)\alpha_1,\ Q=\left(\Im_1-3\Im_2\alpha_1^2+\Im_2\beta_1^2\right)\beta_1,$$

$$Q_1=\cos\beta_1\exp\alpha_1,\ Q_2=\sin\beta_1\exp\alpha_1,\ Q_3=\cos\beta_1\exp\left(-\alpha_1\right),\ Q_4=\sin\beta_1\exp\left(-\alpha_1\right),\ Q_5=P_3\alpha_1+P_4\beta_1,$$

$$Q_6=P_4\alpha_1-P_3\beta_1,\ Q_7=P_5\alpha_1+P_6\beta_1,\ Q_8=P_5\beta_1-P_6\alpha_1,\ Q_9=\frac{P}{Q}\frac{d}{b},\ Q_9^*=\frac{2P}{Q},\ Q_{10}=Q_3-Q_1,$$

$$Q_{11}=\left(1-Q_1\right)\frac{d}{b},\ Q_{12}=Q_6+Q_7,\ Q_{13}=Q_6\frac{d}{b},\ Q_{14}=Q_4-Q_2,\ Q_{14}^*=Q_2Q_9^*+Q_{10},\ Q_{15}=Q_{11}+Q_2Q_9,$$

$$Q_{16}=Q_8-Q_5,\ Q_{16}^*=Q_5Q_9^*-Q_{12},\ Q_{17}=Q_5Q_9-Q_{13},$$

$$P_1=\Im_1-\Im_2\alpha_1^2+\Im_2\beta_1^2,\ P_2=2\Im_2\alpha_1\beta_1,\ P_3=\left(P_1\sin\beta_1-P_2\cos\beta_1\right)\exp\left(\alpha_1\right),$$

$$P_4=\left(P_2\sin\beta_1+P_1\cos\beta_1\right)\exp\left(\alpha_1\right),\ P_5=\left(P_1\cos\beta_1-P_2\sin\beta_1\right)\exp\left(-\alpha_1\right),$$

$$P_6=\left(P_1\sin\beta_1+P_2\cos\beta_1\right)\exp\left(-\alpha_1\right),$$

$$P_3^*=P_1\left(\alpha_1C_{10}-\beta_1C_9\right)+P_2\left(\beta_1C_{10}+\alpha_1C_9\right),\ P_4^*=P_1\left(\beta_1C_{10}+\alpha_1C_9\right)-P_2\left(\alpha_1C_{10}-\beta_1C_9\right),$$

$$P_5^*=-\left[P_1\left(\alpha_1C_{12}+\beta_1C_{11}\right)+P_2\left(\beta_1C_{12}-\alpha_1C_{11}\right)\right],\ P_6^*=P_1\left(\beta_1C_{12}-\alpha_1C_{11}\right)-P_2\left(\alpha_1C_{12}+\beta_1C_{11}\right),$$

$$C_9=-\left(C_{11}+\frac{d}{b}\right),\ C_{10}=Q_9^*C_{11}+Q_9-C_{12},\ C_{11}=-\frac{1}{Q_{14}^*}\left(Q_{14}C_{12}+Q_{15}\right),\ C_{12}=\frac{Q_{16}^*Q_{15}-Q_{17}Q_{14}^*}{Q_{16}Q_{14}^*-Q_{16}^*Q_{14}}.$$