1. Collected Data and Designed Matrices

1.1. **Jet engine system.**

Collected data.

$$\mathbb{U}_- = \begin{bmatrix} 93.41 & 9.446 & 94.54 & 42.96 & 39.55 & -56.78 & 95.25 \\ -98.75 & -49.4 & -13.04 & 55.88 & -60.46 & 72.6 & 96.68 & -67.23 \end{bmatrix}$$

$$\mathbb{X}_- = \begin{bmatrix} 0.025 & 0.02498 & 0.02505 & 0.02513 & 0.02531 & 0.02553 & 0.02579 & 0.02599 \\ 0.02 & -0.07338 & -0.0828 & -0.1773 & -0.2203 & -0.2598 & -0.203 & -0.2982 \\ 0.02629 & 0.02649 & 0.02663 & 0.02677 & 0.02696 & 0.02709 & 0.0273 \\ -0.1994 & -0.15 & -0.1369 & -0.1928 & -0.1323 & -0.2048 & -0.3015 \end{bmatrix}$$

$$\mathbb{X}_+ = \begin{bmatrix} 0.02498 & 0.02505 & 0.02513 & 0.02531 & 0.02553 & 0.02579 & 0.02599 & 0.02629 \\ -0.07338 & -0.0828 & -0.1773 & -0.2203 & -0.2598 & -0.203 & -0.2982 & -0.1994 \\ 0.02649 & 0.02663 & 0.02677 & 0.02696 & 0.02709 & 0.0273 & 0.0276 \\ -0.15 & -0.1369 & -0.1928 & -0.1323 & -0.2048 & -0.3015 & -0.2342 \end{bmatrix}$$

$$\mathbb{M}_- = \begin{bmatrix} 0.025 & 0.02498 & 0.02505 & 0.02513 & 0.02531 & 0.02553 \\ 0.02 & -0.07338 & -0.0828 & -0.1773 & -0.2203 & -0.2598 \\ 0.000625 & 0.000624 & 0.0006276 & 0.0006317 & 0.0006406 & 0.0006517 \\ 0.0005 & -0.001833 & -0.002074 & -0.004457 & -0.005575 & -0.006632 \\ 0.0004 & 0.005385 & 0.006856 & 0.03144 & 0.04851 & 0.06748 \\ 1.563e-5 & 1.559e-5 & 1.572e-5 & 1.588e-5 & 1.621e-5 & 1.664e-5 \\ 1.25e-5 & -4.579e-5 & -5.196e-5 & -0.000112 & -0.0001411 & -0.0001693 \\ 1.0e-5 & 0.0001345 & 0.0001718 & 0.0007902 & 0.001228 & 0.001723 \\ 8.0e-6 & -0.0003951 & -0.0005677 & -0.005575 & -0.01068 & -0.01753 \end{bmatrix}$$

$$\begin{bmatrix} 0.02579 & 0.02599 & 0.02629 & 0.02649 & 0.02663 \\ -0.203 & -0.2982 & -0.1994 & -0.15 & -0.1369 \\ 0.000665 & 0.0006755 & 0.000691 & 0.0007015 & 0.0007094 \\ -0.005234 & -0.00775 & -0.005242 & -0.003972 & -0.003647 \\ 0.04119 & 0.08892 & 0.03977 & 0.0225 & 0.01875 \\ 1.715e-5 & 1.756e-5 & 1.816e-5 & 1.858e-5 & 1.889e-5 \\ -0.000135 & -0.0002014 & -0.0001378 & -0.0001052 & -9.713e-5 \\ 0.001062 & 0.002311 & 0.001045 & 0.0005958 & 0.0004993 \\ -0.008361 & -0.02652 & -0.00793 & -0.003374 & -0.002567 \end{bmatrix}$$

$$\begin{bmatrix} 0.02677 & 0.02696 & 0.02709 & 0.0273 \\ -0.1928 & -0.1323 & -0.2048 & -0.3015 \\ 0.0007166 & 0.0007269 & 0.000734 & 0.0007451 \\ -0.00516 & -0.003566 & -0.00555 & -0.00823 \\ 0.03716 & 0.0175 & 0.04196 & 0.0909 \\ 1.918e-5 & 1.96e-5 & 1.989e-5 & 2.034e-5 \\ -0.0001381 & -9.616e-5 & -0.0001504 & -0.0002247 \\ 0.0009947 & 0.0004718 & 0.001137 & 0.002481 \\ -0.007163 & -0.002314 & -0.008596 & -0.02741 \end{bmatrix}$$

Transformation matrix.

$$\Theta(x) = \begin{bmatrix} 1 & 0 \\ 0 & 1 \\ x_1 & 0 \\ 0 & x_1 \\ 0 & x_2 \\ x_1^2 & 0 \\ x_1x_2 & 0 \\ 0 & x_1x_2 \\ 0 & x_2^2 \end{bmatrix}$$

***Designed matrices via* SOSTOOLS.**

$$P = \begin{bmatrix} 48270.0 & 23.47 \\ 23.47 & 161.2 \end{bmatrix}$$

$$\mathbb{H}(x) = \begin{bmatrix} -1.7022x_1^2 + 4.1052x_1x_2 - 0.00047269x_2^2 + 0.36189x_1 + 0.00038986x_2 - 0.0070921 \\ 648.4605x_1^2 + 67.4375x_1x_2 + 0.00024358x_2^2 - 33.5316x_1 + 0.00021834x_2 + 0.43945 \\ -676.3758x_1^2 - 89.3973x_1x_2 + 0.0010902x_2^2 + 33.0721x_1 - 0.0034425x_2 - 0.4121 \\ 968.345x_1^2 + 116.6953x_1x_2 - 0.0011028x_2^2 - 47.831x_1 + 0.0054063x_2 + 0.60115 \\ -423.3516x_1^2 - 81.6772x_1x_2 - 8.1242e-05x_2^2 + 21.3402x_1 - 0.0011081x_2 - 0.27641 \\ -1158.7182x_1^2 - 200.3469x_1x_2 + 0.00086537x_2^2 + 57.2769x_1 - 0.0064767x_2 - 0.72587 \\ 401.5113x_1^2 + 125.6046x_1x_2 - 0.00071723x_2^2 - 19.0743x_1 + 0.0046273x_2 + 0.23709 \\ 763.3336x_1^2 + 127.2849x_1x_2 + 0.00023831x_2^2 - 38.4233x_1 + 0.001247x_2 + 0.4951 \\ 869.8054x_1^2 + 164.2407x_1x_2 - 0.0011288x_2^2 - 42.9027x_1 + 0.0051164x_2 + 0.54392 \\ -1812.3092x_1^2 - 233.1198x_1x_2 + 0.00095527x_2^2 + 91.1522x_1 - 0.0051083x_2 - 1.1672 \\ -1567.0193x_1^2 - 198.0042x_1x_2 + 0.00095925x_2^2 + 79.2628x_1 - 0.0037495x_2 - 1.0202 \\ 491.2578x_1^2 + 51.2856x_1x_2 - 0.00038029x_2^2 - 25.3892x_1 - 0.00037843x_2 + 0.33251 \\ 1948.0167x_1^2 + 253.7048x_1x_2 - 0.001133x_2^2 - 96.288x_1 + 0.0082231x_2 + 1.2127 \\ -186.8581x_1^2 - 70.4766x_1x_2 + 0.00083803x_2^2 + 6.9657x_1 - 0.0069848x_2 - 0.063873 \\ -263.2211x_1^2 - 37.335x_1x_2 - 0.00017406x_2^2 + 13.9164x_1 + 0.0020199x_2 - 0.18679 \end{bmatrix}$$

$$\begin{bmatrix} 0.24782x_1^2 + 52.6261x_1x_2 + 0.97223x_2^2 - 42.9273x_1 - 0.80187x_2 + 0.38837 \\ -94.4081x_1^2 - 6.1159x_1x_2 - 0.501x_2^2 - 1056.495x_1 - 0.44907x_2 + 13.7945 \\ 98.4722x_1^2 - 303.7364x_1x_2 - 2.2423x_2^2 + 1266.1564x_1 + 7.0805x_2 - 15.0154 \\ -140.9794x_1^2 + 454.0286x_1x_2 + 2.2681x_2^2 - 1640.1676x_1 - 11.1197x_2 + 19.223 \\ 61.6349x_1^2 - 71.5483x_1x_2 + 0.1671x_2^2 + 1258.5145x_1 + 2.2791x_2 - 16.1928 \\ 168.6955x_1^2 - 516.1071x_1x_2 - 1.7799x_2^2 + 2950.0849x_1 + 13.3213x_2 - 36.3193 \\ -58.4552x_1^2 + 375.3415x_1x_2 + 1.4752x_2^2 - 1843.5465x_1 - 9.5174x_2 + 22.6072 \\ -111.1322x_1^2 + 74.8995x_1x_2 - 0.49016x_2^2 - 1949.1028x_1 - 2.5648x_2 + 24.9525 \\ -126.6332x_1^2 + 420.572x_1x_2 + 2.3216x_2^2 - 2422.8385x_1 - 10.5233x_2 + 29.8901 \\ 263.8505x_1^2 - 407.2445x_1x_2 - 1.9648x_2^2 + 3474.7848x_1 + 10.5067x_2 - 43.3894 \\ 228.1392x_1^2 - 300.874x_1x_2 - 1.973x_2^2 + 2976.492x_1 + 7.7119x_2 - 37.4838 \\ -71.5213x_1^2 - 29.6903x_1x_2 + 0.78218x_2^2 - 813.5363x_1 + 0.77836x_2 + 10.7852 \\ -283.6079x_1^2 + 665.2187x_1x_2 + 2.3303x_2^2 - 3670.2616x_1 - 16.9134x_2 + 44.4138 \\ 27.2043x_1^2 - 583.7408x_1x_2 - 1.7237x_2^2 + 877.9592x_1 + 14.3663x_2 - 8.7356 \\ 38.3218x_1^2 + 176.3662x_1x_2 + 0.35801x_2^2 + 634.8719x_1 - 4.1545x_2 - 8.9182 \end{bmatrix}$$

1.2. **Lorenz system.**

Collected data.

$$\mathbb{U}_- = \begin{bmatrix} 93.41 & 9.446 & 94.54 & 42.96 & 39.55 & -56.78 & 95.25 & -98.75 & -49.4 & -13.04 \\ 55.88 & -60.46 & 72.6 & 96.68 & -67.23 \end{bmatrix}$$

$$\mathbb{X}_- = \begin{bmatrix} 1.5 & 1.5 & 1.501 & 1.503 & 1.506 & 1.51 & 1.515 & 1.519 & 1.525 & 1.53 \\ 1.5 & 1.632 & 1.679 & 1.811 & 1.892 & 1.969 & 1.949 & 2.082 & 2.021 & 2.009 \\ 1.5 & 1.498 & 1.497 & 1.495 & 1.493 & 1.491 & 1.49 & 1.488 & 1.486 & 1.484 \\ 1.534 & 1.539 & 1.545 & 1.551 & 1.557 \\ 2.034 & 2.127 & 2.105 & 2.215 & 2.35 \\ 1.483 & 1.481 & 1.479 & 1.478 & 1.476 \end{bmatrix}$$

$$\mathbb{X}_+ = \begin{bmatrix} 1.5 & 1.501 & 1.503 & 1.506 & 1.51 & 1.515 & 1.519 & 1.525 & 1.53 & 1.534 \\ 1.632 & 1.679 & 1.811 & 1.892 & 1.969 & 1.949 & 2.082 & 2.021 & 2.009 & 2.034 \\ 1.498 & 1.497 & 1.495 & 1.493 & 1.491 & 1.49 & 1.488 & 1.486 & 1.484 & 1.483 \\ 1.539 & 1.545 & 1.551 & 1.557 & 1.565 \\ 2.127 & 2.105 & 2.215 & 2.35 & 2.32 \\ 1.481 & 1.479 & 1.478 & 1.476 & 1.474 \end{bmatrix}$$

$$\mathbb{M}_- = \begin{bmatrix} 1.5 & 1.5 & 1.501 & 1.503 & 1.506 & 1.51 & 1.515 & 1.519 & 1.525 & 1.53 \\ 1.5 & 1.632 & 1.679 & 1.811 & 1.892 & 1.969 & 1.949 & 2.082 & 2.021 & 2.009 \\ 1.5 & 1.498 & 1.497 & 1.495 & 1.493 & 1.491 & 1.49 & 1.488 & 1.486 & 1.484 \\ 2.25 & 2.447 & 2.521 & 2.723 & 2.85 & 2.973 & 2.953 & 3.163 & 3.081 & 3.073 \\ 2.25 & 2.445 & 2.513 & 2.708 & 2.825 & 2.936 & 2.904 & 3.098 & 3.003 & 2.982 \\ 2.25 & 2.247 & 2.247 & 2.247 & 2.249 & 2.252 & 2.256 & 2.26 & 2.266 & 2.271 \\ 1.534 & 1.539 & 1.545 & 1.551 & 1.557 \\ 2.034 & 2.127 & 2.105 & 2.215 & 2.35 \\ 1.483 & 1.481 & 1.479 & 1.478 & 1.476 \\ 3.12 & 3.275 & 3.252 & 3.435 & 3.659 \\ 3.015 & 3.151 & 3.113 & 3.273 & 3.468 \\ 2.275 & 2.28 & 2.286 & 2.292 & 2.299 \end{bmatrix}$$

Transformation matrix.

$$\Theta(x) = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \\ x_2 & 0 & 0 \\ 0 & x_3 & 0 \\ 0 & 0 & x_1 \end{bmatrix}$$

***Designed matrices via* SOSTOOLS.**

$$P = \begin{bmatrix} 636.2 & -343.3 & 208.5 \\ -343.3 & 1214.0 & -3.128 \\ 208.5 & -3.128 & 86450.0 \end{bmatrix}$$

$$
\mathbb{H}(x) = \begin{bmatrix}
1.0301 \times 10^{-9} x_1^2 - 1.077 \times 10^{-9} x_1 x_2 + 7.0701 \times 10^{-10} x_1 x_3 \\
-6.1181 \times 10^{-10} x_1^2 + 7.2666 \times 10^{-10} x_1 x_2 - 4.6275 \times 10^{-10} x_1 x_3 \\
6.774 \times 10^{-10} x_1^2 + 4.904 \times 10^{-10} x_1 x_2 - 3.4432 \times 10^{-10} x_1 x_3 \\
-2.4126 \times 10^{-9} x_1^2 + 5.7579 \times 10^{-10} x_1 x_2 - 3.6993 \times 10^{-10} x_1 x_3 \\
-2.2994 \times 10^{-10} x_1^2 + 1.1946 \times 10^{-10} x_1 x_2 - 7.6542 \times 10^{-11} x_1 x_3 \\
1.0137 \times 10^{-9} x_1^2 - 7.6746 \times 10^{-12} x_1 x_2 + 7.1697 \times 10^{-12} x_1 x_3 \\
2.6776 \times 10^{-10} x_1^2 - 5.3979 \times 10^{-10} x_1 x_2 + 3.5021 \times 10^{-10} x_1 x_3 \\
1.5601 \times 10^{-9} x_1^2 - 7.3668 \times 10^{-10} x_1 x_2 + 4.8467 \times 10^{-10} x_1 x_3 \\
-1.2488 \times 10^{-9} x_1^2 + 1.5229 \times 10^{-11} x_1 x_2 - 4.7934 \times 10^{-12} x_1 x_3 \\
3.9179 \times 10^{-11} x_1^2 + 2.5358 \times 10^{-10} x_1 x_2 - 1.7243 \times 10^{-10} x_1 x_3 \\
-6.4322 \times 10^{-10} x_1^2 - 6.1547 \times 10^{-12} x_1 x_2 + 6.1223 \times 10^{-12} x_1 x_3 \\
7.5432 \times 10^{-10} x_1^2 - 1.6593 \times 10^{-10} x_1 x_2 + 9.1843 \times 10^{-11} x_1 x_3 \\
-6.9034 \times 10^{-10} x_1^2 + 4.123 \times 10^{-10} x_1 x_2 - 2.5929 \times 10^{-10} x_1 x_3 \\
1.5219 \times 10^{-9} x_1^2 - 2.7381 \times 10^{-10} x_1 x_2 + 1.8496 \times 10^{-10} x_1 x_3 \\
-1.0261 \times 10^{-9} x_1^2 + 2.1427 \times 10^{-10} x_1 x_2 - 1.4265 \times 10^{-10} x_1 x_3
\end{bmatrix}
$$

$$
\begin{bmatrix}
-8.2746 \times 10^{-10} x_2^2 + 8.4444 \times 10^{-10} x_2 x_3 - 5.6854 \times 10^{-10} x_3^2 \\
+7.4204 \times 10^{-10} x_2^2 - 6.9346 \times 10^{-10} x_2 x_3 + 5.1257 \times 10^{-10} x_3^2 \\
+1.4052 \times 10^{-10} x_2^2 - 2.2523 \times 10^{-10} x_2 x_3 + 9.2443 \times 10^{-11} x_3^2 \\
+4.4993 \times 10^{-10} x_2^2 - 4.5799 \times 10^{-10} x_2 x_3 + 3.1035 \times 10^{-10} x_3^2 \\
+1.3838 \times 10^{-10} x_2^2 - 1.2344 \times 10^{-10} x_2 x_3 + 9.5492 \times 10^{-11} x_3^2 \\
+6.2778 \times 10^{-11} x_2^2 - 4.0181 \times 10^{-11} x_2 x_3 + 4.3974 \times 10^{-11} x_3^2 \\
-4.9027 \times 10^{-10} x_2^2 + 4.7537 \times 10^{-10} x_2 x_3 - 3.3775 \times 10^{-10} x_3^2 \\
-5.189 \times 10^{-10} x_2^2 + 5.4622 \times 10^{-10} x_2 x_3 - 3.5652 \times 10^{-10} x_3^2 \\
+3.3008 \times 10^{-11} x_2^2 - 2.7036 \times 10^{-11} x_2 x_3 + 2.3482 \times 10^{-11} x_3^2 \\
+1.6956 \times 10^{-10} x_2^2 - 1.8478 \times 10^{-10} x_2 x_3 + 1.1626 \times 10^{-10} x_3^2 \\
-3.6538 \times 10^{-11} x_2^2 + 2.5244 \times 10^{-11} x_2 x_3 - 2.6025 \times 10^{-11} x_3^2 \\
-3.4921 \times 10^{-10} x_2^2 + 2.7923 \times 10^{-10} x_2 x_3 - 2.4279 \times 10^{-10} x_3^2 \\
+4.8655 \times 10^{-10} x_2^2 - 4.3505 \times 10^{-10} x_2 x_3 + 3.3669 \times 10^{-10} x_3^2 \\
-1.2258 \times 10^{-10} x_2^2 + 1.5655 \times 10^{-10} x_2 x_3 - 8.2996 \times 10^{-11} x_3^2 \\
+1.2241 \times 10^{-10} x_2^2 - 1.4058 \times 10^{-10} x_2 x_3 + 8.354 \times 10^{-11} x_3^2
\end{bmatrix}
$$

$$
\begin{bmatrix}
-0.0049826 x_1 - 0.38088 x_2 - 0.39111 x_3 - 1.6847 \\
+0.0036736 x_1 + 0.3617 x_2 + 0.64673 x_3 + 1.1993 \\
+0.0018544 x_1 + 0.095183 x_2 - 0.33189 x_3 + 0.5856 \\
+0.0026769 x_1 + 0.22714 x_2 + 0.22164 x_3 + 0.85481 \\
+0.00064825 x_1 + 0.070436 x_2 + 0.13842 x_3 + 0.18155 \\
+8.448 \times 10^{-5} x_1 + 0.023119 x_2 + 0.14189 x_3 + 0.018972 \\
-0.002621 x_1 - 0.23807 x_2 - 0.34411 x_3 - 0.87697 \\
-0.0033409 x_1 - 0.25972 x_2 - 0.16451 x_3 - 1.115 \\
+0.00010706 x_1 - 0.010691 x_2 + 0.057934 x_3 + 0.09678 \\
+0.0011446 x_1 + 0.047774 x_2 + 0.044051 x_3 + 0.47533 \\
-5.6505 \times 10^{-5} x_1 - 0.049186 x_2 - 0.071273 x_3 + 0.066143 \\
-0.0012031 x_1 - 0.17441 x_2 - 0.51089 x_3 - 0.34463 \\
+0.0021945 x_1 + 0.19999 x_2 + 0.51508 x_3 + 0.79894 \\
-0.0011063 x_1 - 0.044979 x_2 + 0.083911 x_3 - 0.41172 \\
+0.00092839 x_1 + 0.13255 x_2 - 0.035908 x_3 + 0.15672
\end{bmatrix}
$$

$$6.612 \times 10^{-10} x_1^2 - 4.5438 \times 10^{-10} x_1 x_2 + 4.4184 \times 10^{-10} x_1 x_3$$
$$-4.2052 \times 10^{-10} x_1^2 + 3.6223 \times 10^{-10} x_1 x_2 - 2.7963 \times 10^{-10} x_1 x_3$$
$$-3.2876 \times 10^{-10} x_1^2 + 1.3073 \times 10^{-10} x_1 x_2 - 2.2396 \times 10^{-10} x_1 x_3$$
$$-3.5327 \times 10^{-10} x_1^2 + 2.5052 \times 10^{-10} x_1 x_2 - 2.3472 \times 10^{-10} x_1 x_3$$
$$-6.8855 \times 10^{-11} x_1^2 + 6.8471 \times 10^{-11} x_1 x_2 - 5.1133 \times 10^{-11} x_1 x_3$$
$$-6.8747 \times 10^{-12} x_1^2 + 1.6883 \times 10^{-11} x_1 x_2 + 1.3018 \times 10^{-11} x_1 x_3$$
$$3.2494 \times 10^{-10} x_1^2 - 2.5477 \times 10^{-10} x_1 x_2 + 2.1625 \times 10^{-10} x_1 x_3$$
$$4.702 \times 10^{-10} x_1^2 - 2.9917 \times 10^{-10} x_1 x_2 + 3.0945 \times 10^{-10} x_1 x_3$$
$$8.4803 \times 10^{-12} x_1^2 + 1.6072 \times 10^{-11} x_1 x_2 - 6.3382 \times 10^{-12} x_1 x_3$$
$$-1.5058 \times 10^{-10} x_1^2 + 1.0433 \times 10^{-10} x_1 x_2 - 1.0282 \times 10^{-10} x_1 x_3$$
$$-2.94 \times 10^{-11} x_1^2 - 1.6548 \times 10^{-11} x_1 x_2 - 5.3155 \times 10^{-12} x_1 x_3$$
$$7.9143 \times 10^{-11} x_1^2 - 1.4429 \times 10^{-10} x_1 x_2 + 4.2237 \times 10^{-11} x_1 x_3$$
$$-2.3181 \times 10^{-10} x_1^2 + 2.3095 \times 10^{-10} x_1 x_2 - 1.4795 \times 10^{-10} x_1 x_3$$
$$1.9012 \times 10^{-10} x_1^2 - 8.9852 \times 10^{-11} x_1 x_2 + 1.2065 \times 10^{-10} x_1 x_3$$
$$-1.4428 \times 10^{-10} x_1^2 + 7.901 \times 10^{-11} x_1 x_2 - 9.2026 \times 10^{-11} x_1 x_3$$

$$-3.8205 \times 10^{-10} x_2^2 + 7.332 \times 10^{-10} x_2 x_3 - 4.075 \times 10^{-10} x_3^2$$
$$+3.4051 \times 10^{-10} x_2^2 - 6.0849 \times 10^{-10} x_2 x_3 + 3.636 \times 10^{-10} x_3^2$$
$$+6.7381 \times 10^{-11} x_2^2 - 1.8637 \times 10^{-10} x_2 x_3 + 7.091 \times 10^{-11} x_3^2$$
$$+2.0758 \times 10^{-10} x_2^2 - 3.9718 \times 10^{-10} x_2 x_3 + 2.2199 \times 10^{-10} x_3^2$$
$$+6.3509 \times 10^{-11} x_2^2 - 1.1078 \times 10^{-10} x_2 x_3 + 6.8131 \times 10^{-11} x_3^2$$
$$+2.8152 \times 10^{-11} x_2^2 - 3.7154 \times 10^{-11} x_2 x_3 + 3.0101 \times 10^{-11} x_3^2$$
$$-2.2467 \times 10^{-10} x_2^2 + 4.134 \times 10^{-10} x_2 x_3 - 2.403 \times 10^{-10} x_3^2$$
$$-2.4077 \times 10^{-10} x_2^2 + 4.7404 \times 10^{-10} x_2 x_3 - 2.5683 \times 10^{-10} x_3^2$$
$$+1.5154 \times 10^{-11} x_2^2 - 2.4189 \times 10^{-11} x_2 x_3 + 1.6937 \times 10^{-11} x_3^2$$
$$+7.8308 \times 10^{-11} x_2^2 - 1.5929 \times 10^{-10} x_2 x_3 + 8.3996 \times 10^{-11} x_3^2$$
$$-1.6178 \times 10^{-11} x_2^2 + 2.2723 \times 10^{-11} x_2 x_3 - 1.8523 \times 10^{-11} x_3^2$$
$$-1.5875 \times 10^{-10} x_2^2 + 2.5343 \times 10^{-10} x_2 x_3 - 1.708 \times 10^{-10} x_3^2$$
$$+2.2215 \times 10^{-10} x_2^2 - 3.8438 \times 10^{-10} x_2 x_3 + 2.3856 \times 10^{-10} x_3^2$$
$$-5.7162 \times 10^{-11} x_2^2 + 1.3147 \times 10^{-10} x_2 x_3 - 6.0926 \times 10^{-11} x_3^2$$
$$+5.6977 \times 10^{-11} x_2^2 - 1.2066 \times 10^{-10} x_2 x_3 + 6.0769 \times 10^{-11} x_3^2$$

$$-0.0013753 x_1 - 0.10768 x_2 - 0.72431 x_3 + 0.69403$$
$$+0.001014 x_1 + 0.10226 x_2 + 1.1977 x_3 - 1.4126$$
$$+0.00051183 x_1 + 0.026909 x_2 - 0.61464 x_3 + 0.87169$$
$$+0.0007389 x_1 + 0.064213 x_2 + 0.41045 x_3 - 0.42933$$
$$+0.00017894 x_1 + 0.019913 x_2 + 0.25634 x_3 - 0.31865$$
$$+2.3313 \times 10^{-5} x_1 + 0.0065357 x_2 + 0.26277 x_3 - 0.33936$$
$$-0.00072341 x_1 - 0.067303 x_2 - 0.63726 x_3 + 0.71479$$
$$-0.00092214 x_1 - 0.073424 x_2 - 0.30465 x_3 + 0.24701$$
$$+2.9485 \times 10^{-5} x_1 - 0.0030225 x_2 + 0.10729 x_3 - 0.099937$$
$$+0.00031591 x_1 + 0.013506 x_2 + 0.081579 x_3 - 0.0016099$$
$$-1.5623 \times 10^{-5} x_1 - 0.013905 x_2 - 0.13199 x_3 + 0.21664$$
$$-0.00033207 x_1 - 0.049306 x_2 - 0.94613 x_3 + 1.2105$$
$$+0.00060578 x_1 + 0.056538 x_2 + 0.9539 x_3 - 1.1109$$
$$-0.00030536 x_1 - 0.012716 x_2 + 0.1554 x_3 - 0.28138$$
$$+0.00025624 x_1 + 0.037472 x_2 - 0.066499 x_3 + 0.039457$$

$$
\begin{array}{c}
1.319 \times 10^{-10} x_2^2 - 2.5013 \times 10^{-10} x_2 x_3 + 9.8501 \times 10^{-11} x_3^2 \\
-1.1605 \times 10^{-10} x_2^2 + 2.0613 \times 10^{-10} x_2 x_3 - 8.7184 \times 10^{-11} x_3^2 \\
-2.5283 \times 10^{-11} x_2^2 + 6.5533 \times 10^{-11} x_2 x_3 - 1.8121 \times 10^{-11} x_3^2 \\
-7.1681 \times 10^{-11} x_2^2 + 1.3548 \times 10^{-10} x_2 x_3 - 5.3705 \times 10^{-11} x_3^2 \\
-2.1274 \times 10^{-11} x_2^2 + 3.7346 \times 10^{-11} x_2 x_3 - 1.5959 \times 10^{-11} x_3^2 \\
-9.1163 \times 10^{-12} x_2^2 + 1.2383 \times 10^{-11} x_2 x_3 - 7.0925 \times 10^{-12} x_3^2 \\
7.7012 \times 10^{-11} x_2^2 - 1.4083 \times 10^{-10} x_2 x_3 + 5.7751 \times 10^{-11} x_3^2 \\
8.334 \times 10^{-11} x_2^2 - 1.6205 \times 10^{-10} x_2 x_3 + 6.2235 \times 10^{-11} x_3^2 \\
-5.2509 \times 10^{-12} x_2^2 + 8.0943 \times 10^{-12} x_2 x_3 - 4.0054 \times 10^{-12} x_3^2 \\
-2.7485 \times 10^{-11} x_2^2 + 5.4235 \times 10^{-11} x_2 x_3 - 2.0281 \times 10^{-11} x_3^2 \\
5.7887 \times 10^{-12} x_2^2 - 7.2844 \times 10^{-12} x_2 x_3 + 4.2368 \times 10^{-12} x_3^2 \\
5.3056 \times 10^{-11} x_2^2 - 8.4417 \times 10^{-11} x_2 x_3 + 4.0119 \times 10^{-11} x_3^2 \\
-7.5506 \times 10^{-11} x_2^2 + 1.2973 \times 10^{-10} x_2 x_3 - 5.6793 \times 10^{-11} x_3^2 \\
2.0517 \times 10^{-11} x_2^2 - 4.5555 \times 10^{-11} x_2 x_3 + 1.5114 \times 10^{-11} x_3^2 \\
-2.0013 \times 10^{-11} x_2^2 + 4.1425 \times 10^{-11} x_2 x_3 - 1.4834 \times 10^{-11} x_3^2
\end{array}
$$

$$
\begin{array}{c}
+1.319 \times 10^{-10} x_2^2 - 2.5013 \times 10^{-10} x_2 x_3 + 9.8501 \times 10^{-11} x_3^2 \\
-1.1605 \times 10^{-10} x_2^2 + 2.0613 \times 10^{-10} x_2 x_3 - 8.7184 \times 10^{-11} x_3^2 \\
-2.5283 \times 10^{-11} x_2^2 + 6.5533 \times 10^{-11} x_2 x_3 - 1.8121 \times 10^{-11} x_3^2 \\
-7.1681 \times 10^{-11} x_2^2 + 1.3548 \times 10^{-10} x_2 x_3 - 5.3705 \times 10^{-11} x_3^2 \\
-2.1274 \times 10^{-11} x_2^2 + 3.7346 \times 10^{-11} x_2 x_3 - 1.5959 \times 10^{-11} x_3^2 \\
-9.1163 \times 10^{-12} x_2^2 + 1.2383 \times 10^{-11} x_2 x_3 - 7.0925 \times 10^{-12} x_3^2 \\
+7.7012 \times 10^{-11} x_2^2 - 1.4083 \times 10^{-10} x_2 x_3 + 5.7751 \times 10^{-11} x_3^2 \\
+8.334 \times 10^{-11} x_2^2 - 1.6205 \times 10^{-10} x_2 x_3 + 6.2235 \times 10^{-11} x_3^2 \\
-5.2509 \times 10^{-12} x_2^2 + 8.0943 \times 10^{-12} x_2 x_3 - 4.0054 \times 10^{-12} x_3^2 \\
-2.7485 \times 10^{-11} x_2^2 + 5.4235 \times 10^{-11} x_2 x_3 - 2.0281 \times 10^{-11} x_3^2 \\
+5.7887 \times 10^{-12} x_2^2 - 7.2844 \times 10^{-12} x_2 x_3 + 4.2368 \times 10^{-12} x_3^2 \\
+5.3056 \times 10^{-11} x_2^2 - 8.4417 \times 10^{-11} x_2 x_3 + 4.0119 \times 10^{-11} x_3^2 \\
-7.5506 \times 10^{-11} x_2^2 + 1.2973 \times 10^{-10} x_2 x_3 - 5.6793 \times 10^{-11} x_3^2 \\
+2.0517 \times 10^{-11} x_2^2 - 4.5555 \times 10^{-11} x_2 x_3 + 1.5114 \times 10^{-11} x_3^2 \\
-2.0013 \times 10^{-11} x_2^2 + 4.1425 \times 10^{-11} x_2 x_3 - 1.4834 \times 10^{-11} x_3^2
\end{array}
$$

$$
\left[\begin{array}{c}
+0.012941 x_1 + 0.00091455 x_2 + 0.00091689 x_3 - 0.00010185 \\
-0.0095408 x_1 - 0.0008685 x_2 - 0.0015161 x_3 - 0.0032186 \\
-0.0048159 x_1 - 0.00022854 x_2 + 0.00077812 x_3 + 0.0051517 \\
-0.0069527 x_1 - 0.00054538 x_2 - 0.00051965 x_3 + 0.00031871 \\
-0.0016838 x_1 - 0.00016913 x_2 - 0.00032451 x_3 - 0.00057674 \\
-0.00021898 x_1 - 5.5524 \times 10^{-5} x_2 - 0.00033269 x_3 - 0.0012769 \\
+0.006807 x_1 + 0.00057161 x_2 + 0.00080674 x_3 + 0.0012844 \\
+0.0086769 x_1 + 0.00062364 x_2 + 0.00038571 x_3 - 0.0011468 \\
-0.0002779 x_1 + 2.5665 \times 10^{-5} x_2 - 0.00013581 x_3 - 0.00094333 \\
-0.0029725 x_1 - 0.00011468 x_2 - 0.00010327 x_3 - 0.00017385 \\
+0.00014666 x_1 + 0.0001181 x_2 + 0.00016707 x_3 + 3.6701 \times 10^{-5} \\
+0.0031246 x_1 + 0.00041879 x_2 + 0.0011977 x_3 + 0.0037004 \\
-0.0056998 x_1 - 0.00048022 x_2 - 0.0012075 x_3 - 0.003839 \\
+0.0028736 x_1 + 0.00010801 x_2 - 0.00019669 x_3 - 0.0014709 \\
-0.0024113 x_1 - 0.00031827 x_2 + 8.417 \times 10^{-5} x_3 + 0.0022608
\end{array}\right]
$$