Appendix

Appendix A: *Proof of Proposition 1*

Consider the following equality

$$E\int_0^{t_f} e^T Re dt = EV\left(e(0)\right) - EV\left(e(t_f)\right) + E\int_0^{t_f}\left(e^T Re + \frac{dV(e)}{dt}\right)dt \tag{A1}$$

By Ito formula (Zhang *et al*., 2005), we get

$$\begin{aligned} &dV(e) \\ &= \left(\frac{\partial V(e)}{\partial e}\right)^T \left(\left(F(x,s) + \left(C\otimes I_m\right)G(x,s) + Hv\right)dt + \left(F_W(x,s) + \left(C\otimes I_m\right)G_W(x,s)\right)dw\right) \\ &\quad + \frac{1}{2}\left(F_W(x,s) + \left(C\otimes I_m\right)G_W(x,s)\right)^T \frac{\partial^2 V(e)}{\partial e^2}\left(F_W(x,s) + \left(C\otimes I_m\right)G_W(x,s)\right)dt \end{aligned} \tag{A2}$$

Substituting (A2) into (A1) and by the fact $EdW = 0$, $EV\left(e(t_f)\right) \geq 0$, we get

$$\begin{aligned} E\int_0^{t_f} e^T Re dt \leq EV\left(e(0)\right) + E\int_0^{t_f}\Bigg(& e^T Re + \left(\frac{\partial V(e)}{\partial e}\right)^T \left(F(x,s) + \left(C\otimes I_m\right)G(x,s) + Hv\right) \\ & + \frac{1}{2}\left(F_W(x,s) + \left(C\otimes I_m\right)G_W(x,s)\right)^T \frac{\partial^2 V(e)}{\partial e^2}\left(F_W(x,s) + \left(C\otimes I_m\right)G_W(x,s)\right)\Bigg)dt \end{aligned} \tag{A3}$$

By the fact that

$$\mathbf{a}^T\mathbf{b} = 2\left(\frac{1}{2\rho}\mathbf{a}\right)^T\left(\rho\mathbf{b}\right) \leq \frac{1}{4\rho^2}\mathbf{a}^T\mathbf{a} + \rho^2\mathbf{b}^T\mathbf{b} \tag{A4}$$

for any $\rho > 0$ and vectors $\mathbf{a}$ and $\mathbf{b}$. Then, we get the following inequality

$$\begin{aligned} &E\int_0^{t_f} e^T Re dt \leq EV\left(e(0)\right) \\ &+E\int_0^{t_f}\Bigg(e^T Re + \left(\frac{\partial V(e)}{\partial e}\right)^T\left(F(x,s) + \left(C\otimes I_m\right)G(x,s)\right) + \frac{1}{4\rho^2}\left(\frac{\partial V(e)}{\partial e}\right)^T HH^T\left(\frac{\partial V(e)}{\partial e}\right) \\ &\quad + \frac{1}{2}\left(F_W(x,s) + \left(C\otimes I_m\right)G_W(x,s)\right)\frac{\partial^2 V(e)}{\partial e^2}\left(F_W(x,s) + \left(C\otimes I_m\right)G_W(x,s)\right)\Bigg)dt \end{aligned}$$

where $\mathbf{a} = H^T\dfrac{\partial V(e)}{\partial e}$ and $\mathbf{b} = v$

By the inequality in (19), we get

$$E\int_0^{t_f} e^T Redt \le EV\left(e(0)\right) + E\rho^2 \int_0^{t_f} v^T vdt \tag{A5}$$

If coupled synthetic genetic network is free of extrinsic noise, i.e., $v(t)=0$, then from (A5), we get

$$E\int_0^{t_f} e^T Redt \le EV\left(e(0)\right) \tag{A6}$$

Since $EV(e(0))$ is a constant, from (A6), we get $E(e(t)) \to 0$ as $t_f \to \infty$ and intrinsic parameter fluctuation is tolerated.

Appendix B: *Proof of Proposition 2*

First, we use the following fuzzy interpolation system

$$de = \sum_{k=1}^{N} \mu_k(z)\Big(\big((I_N \otimes A_k + C \otimes B_k)e + Hv\big)dt + \big((I_N \otimes A_{Wk} + C \otimes B_{Wk})e\big)dw\Big)$$

in (24) to replace (16). Following the proof of Proposition 1 in Appendix A, we get the following result

$$\begin{aligned} &E\int_0^{t_f} e^T Redt \le EV\big(e(0)\big) - EV\big(e(t_f)\big) \\ &+E\int_0^{t_f}\left(e^T Re + \sum_{k=1}^{L}\mu_k(z)\left(\left(\frac{\partial V(e)}{\partial e}\right)^T \big((I_N \otimes A_k + C \otimes B_k)e + Hv\big)\right.\right. \\ &\left.\left.\qquad + \frac{1}{2}e^T (I_N \otimes A_{Wk} + C \otimes B_{Wk})\frac{\partial^2 V(e)}{\partial e^2}(I_N \otimes A_{Wk} + C \otimes B_{Wk})e\right)dt\right) \end{aligned} \tag{B1}$$

By the facts that $V\big(e(t_f)\big) \ge 0$, and

$$\left(\frac{\partial V(e)}{\partial e}\right)^T Hv \le \frac{1}{4\rho^2}\left(\frac{\partial V(e)}{\partial e}\right)^T HH^T\left(\frac{\partial V(e)}{\partial e}\right) + \rho^2 v^T v$$

we get the following result from (B1)

$$\begin{aligned} &E\int_0^{t_f} e^T Redt \le EV\big(e(0)\big) \\ &+E\int_0^{t_f}\left(e^T Re + \sum_{k=1}^{L}\mu_k(z)\left(\left(\frac{\partial V(e)}{\partial e}\right)^T (I_N \otimes A_k + C \otimes B_k)e + \frac{1}{4\rho^2}\left(\frac{\partial V(e)}{\partial e}\right)^T HH^T\left(\frac{\partial V(e)}{\partial e}\right)\right.\right. \\ &\left.\left.\qquad + \rho^2 v^T v + \frac{1}{2}e^T (I_N \otimes A_{Wk} + C \otimes B_{Wk})^T\frac{\partial^2 V(e)}{\partial e^2}(I_N \otimes A_{Wk} + C \otimes B_{Wk})e\right)dt\right) \end{aligned} \tag{B2}$$

If we choose $V(e) = e^T Pe$, then $\frac{\partial V(e)}{\partial e} = 2Pe$, $\frac{\partial^2 V(e)}{\partial e^2} = 2P$, then we get the following result from (B2)

$$\begin{aligned} &E\int_0^{t_f} e^T Redt \le Ee(0)^T Pe(0) \\ &+E\sum_{k=1}^{L}\mu_k(z)\int_0^{t_f} e^T \Big(R + P(I_N \otimes A_k + C \otimes B_k) + (I_N \otimes A_k + C \otimes B_k)^T P \\ &\qquad + (I_N \otimes A_{Wk} + C \otimes B_{Wk})^T P(I_N \otimes A_{Wk} + C \otimes B_{Wk}) + \frac{1}{\rho^2}PHH^T P\Big)edt + \rho^2 v^T vdt \end{aligned} \tag{B3}$$

If

$$R + P\left(I_N \otimes A_k + C \otimes B_k\right) + \left(I_N \otimes A_k + C \otimes B_k\right)^T P$$
$$+\left(I_N \otimes A_{Wk} + C \otimes B_{Wk}\right)^T P\left(I_N \otimes A_{Wk} + C \otimes B_{Wk}\right) + \frac{1}{\rho^2} PHH^T P < 0 \quad \text{(B4)}$$

then we get

$$E\int_0^{t_f} e^T Redt \le Ee(0)^T Pe(0) + E\rho^2 \int_0^{t_f} v^T vdt$$

which is (18) and will be reduced to (17) if $e(0) = 0$.

Therefore, if the LMIs in (B4) hold, then the noise filtering ability ρ on the synchronization of the coupled oscillation systems is achieved. By Schur complement, the inequalities in (B4) are equivalent to the LMIs in (25), i.e. if the LMIs in (25) have a common solution $P > 0$, then the synchronization of nonlinear stochastic coupled synthetic oscillation systems in (8) has a filtering level ρ against the extrinsic noises.

Appendix C:

The fuzzy approximation is employed to approximate the nonlinear stochastic synchronization error dynamic by interpolating several local linear stochastic systems as follows:

$$\begin{aligned} de &= \left(F(x,s)+\left(C\otimes I_m\right)G(x,s)+Hv\right)dt+\left(F_W(x,s)+\left(C\otimes I_m\right)G_W(x,s)\right)dw \\ &= \sum_{k=1}^{16}\mu_k(z)\left(\left(\left(I_N\otimes A_k+C\otimes B\right)e+Hv\right)dt+\left(\left(I_N\otimes A_{Wk}+C\otimes B_W\right)e\right)dw\right) \end{aligned}$$

where

$$A_1=\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -86.4 & 0 \\ 0 & -6.93 & 0 & -86.4 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.15 & 0 & 9.90 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix} \quad A_{W1}=0.01*\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -86.4 & 0 \\ 0 & -6.93 & 0 & -86.4 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.15 & 0 & 9.90 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix}$$

$$A_2=\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -86.4 & 0 \\ 0 & -6.93 & 0 & -86.4 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.15 & 0 & 8.65 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix} \quad A_{W2}=0.01*\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -86.4 & 0 \\ 0 & -6.93 & 0 & -86.4 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.15 & 0 & 8.65 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix}$$

$$A_3=\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -86.4 & 0 \\ 0 & -6.93 & 0 & -86.4 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.00 & 0 & 9.90 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix} \quad A_{W3}=0.01*\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -86.4 & 0 \\ 0 & -6.93 & 0 & -86.4 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.00 & 0 & 9.90 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix}$$

$$A_4=\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -86.4 & 0 \\ 0 & -6.93 & 0 & -86.4 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.00 & 0 & 8.65 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix} \quad A_{W4}=0.01*\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -86.4 & 0 \\ 0 & -6.93 & 0 & -86.4 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.00 & 0 & 8.65 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix}$$

$$A_5=\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -86.4 & 0 \\ 0 & -6.93 & 0 & -0.001 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.15 & 0 & 9.90 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix} \quad A_{W5}=0.01*\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -86.4 & 0 \\ 0 & -6.93 & 0 & -0.001 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.15 & 0 & 9.90 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix}$$

$$A_6=\begin{bmatrix}-6.93&0&0&0&0&-86.4&0\\0&-6.93&0&-0.001&0&0&0\\0&0&-6.93&0&-0.15&0&8.65\\1.00&0&0&-1.15&0&0&0\\0&1.00&0&0&-1.15&0&0\\0&0&1.00&0&0&-1.15&0\\0&0&0&0.10&0&0&-1.00\end{bmatrix}\quad A_{W6}=0.01*\begin{bmatrix}-6.93&0&0&0&0&-86.4&0\\0&-6.93&0&-0.001&0&0&0\\0&0&-6.93&0&-0.15&0&9.90\\1.00&0&0&-1.15&0&0&0\\0&1.00&0&0&-1.15&0&0\\0&0&1.00&0&0&-1.15&0\\0&0&0&0.10&0&0&-1.00\end{bmatrix}$$

$$A_7=\begin{bmatrix}-6.93&0&0&0&0&-86.4&0\\0&-6.93&0&-0.001&0&0&0\\0&0&-6.93&0&-0.00&0&9.90\\1.00&0&0&-1.15&0&0&0\\0&1.00&0&0&-1.15&0&0\\0&0&1.00&0&0&-1.15&0\\0&0&0&0.10&0&0&-1.00\end{bmatrix}\quad A_{W7}=0.01*\begin{bmatrix}-6.93&0&0&0&0&-86.4&0\\0&-6.93&0&-0.001&0&0&0\\0&0&-6.93&0&-0.00&0&9.90\\1.00&0&0&-1.15&0&0&0\\0&1.00&0&0&-1.15&0&0\\0&0&1.00&0&0&-1.15&0\\0&0&0&0.10&0&0&-1.00\end{bmatrix}$$

$$A_8=\begin{bmatrix}-6.93&0&0&0&0&-86.4&0\\0&-6.93&0&-0.001&0&0&0\\0&0&-6.93&0&-0.00&0&8.65\\1.00&0&0&-1.15&0&0&0\\0&1.00&0&0&-1.15&0&0\\0&0&1.00&0&0&-1.15&0\\0&0&0&0.10&0&0&-1.00\end{bmatrix}\quad A_{W8}=0.01*\begin{bmatrix}-6.93&0&0&0&0&-86.4&0\\0&-6.93&0&-0.001&0&0&0\\0&0&-6.93&0&-0.00&0&8.65\\1.00&0&0&-1.15&0&0&0\\0&1.00&0&0&-1.15&0&0\\0&0&1.00&0&0&-1.15&0\\0&0&0&0.10&0&0&-1.00\end{bmatrix}$$

$$A_9=\begin{bmatrix}-6.93&0&0&0&0&-0.001&0\\0&-6.93&0&-86.4&0&0&0\\0&0&-6.93&0&-0.15&0&9.90\\1.00&0&0&-1.15&0&0&0\\0&1.00&0&0&-1.15&0&0\\0&0&1.00&0&0&-1.15&0\\0&0&0&0.10&0&0&-1.00\end{bmatrix}\quad A_{W9}=0.01*\begin{bmatrix}-6.93&0&0&0&0&-0.001&0\\0&-6.93&0&-86.4&0&0&0\\0&0&-6.93&0&-0.15&0&9.90\\1.00&0&0&-1.15&0&0&0\\0&1.00&0&0&-1.15&0&0\\0&0&1.00&0&0&-1.15&0\\0&0&0&0.10&0&0&-1.00\end{bmatrix}$$

$$A_{10}=\begin{bmatrix}-6.93&0&0&0&0&-0.001&0\\0&-6.93&0&-86.4&0&0&0\\0&0&-6.93&0&-0.15&0&8.65\\1.00&0&0&-1.15&0&0&0\\0&1.00&0&0&-1.15&0&0\\0&0&1.00&0&0&-1.15&0\\0&0&0&0.10&0&0&-1.00\end{bmatrix}\quad A_{W10}=0.01*\begin{bmatrix}-6.93&0&0&0&0&-0.001&0\\0&-6.93&0&-86.4&0&0&0\\0&0&-6.93&0&-0.15&0&8.65\\1.00&0&0&-1.15&0&0&0\\0&1.00&0&0&-1.15&0&0\\0&0&1.00&0&0&-1.15&0\\0&0&0&0.10&0&0&-1.00\end{bmatrix}$$

$$A_{11}=\begin{bmatrix}-6.93&0&0&0&0&-0.001&0\\0&-6.93&0&-86.4&0&0&0\\0&0&-6.93&0&-0.00&0&9.90\\1.00&0&0&-1.15&0&0&0\\0&1.00&0&0&-1.15&0&0\\0&0&1.00&0&0&-1.15&0\\0&0&0&0.10&0&0&-1.00\end{bmatrix}\quad A_{W11}=0.01*\begin{bmatrix}-6.93&0&0&0&0&-0.001&0\\0&-6.93&0&-86.4&0&0&0\\0&0&-6.93&0&-0.00&0&9.90\\1.00&0&0&-1.15&0&0&0\\0&1.00&0&0&-1.15&0&0\\0&0&1.00&0&0&-1.15&0\\0&0&0&0.10&0&0&-1.00\end{bmatrix}$$

$$A_{12}=\begin{bmatrix}-6.93&0&0&0&0&-0.001&0\\0&-6.93&0&-86.4&0&0&0\\0&0&-6.93&0&-0.00&0&8.65\\1.00&0&0&-1.15&0&0&0\\0&1.00&0&0&-1.15&0&0\\0&0&1.00&0&0&-1.15&0\\0&0&0&0.10&0&0&-1.00\end{bmatrix}\quad A_{W12}=0.01*\begin{bmatrix}-6.93&0&0&0&0&-0.001&0\\0&-6.93&0&-86.4&0&0&0\\0&0&-6.93&0&-0.00&0&8.65\\1.00&0&0&-1.15&0&0&0\\0&1.00&0&0&-1.15&0&0\\0&0&1.00&0&0&-1.15&0\\0&0&0&0.10&0&0&-1.00\end{bmatrix}$$

$$A_{13}=\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -0.001 & 0 \\ 0 & -6.93 & 0 & -0.001 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.15 & 0 & 9.90 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix} \quad A_{W13}=0.01*\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -0.001 & 0 \\ 0 & -6.93 & 0 & -0.001 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.15 & 0 & 9.90 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix}$$

$$A_{14}=\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -0.001 & 0 \\ 0 & -6.93 & 0 & -0.001 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.15 & 0 & 8.65 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix} \quad A_{W14}=0.01*\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -0.001 & 0 \\ 0 & -6.93 & 0 & -0.001 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.15 & 0 & 8.65 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix}$$

$$A_{15}=\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -0.001 & 0 \\ 0 & -6.93 & 0 & -0.001 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.00 & 0 & 9.90 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix} \quad A_{W15}=0.01*\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -0.001 & 0 \\ 0 & -6.93 & 0 & -0.001 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.00 & 0 & 9.90 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix}$$

$$A_{16}=\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -0.001 & 0 \\ 0 & -6.93 & 0 & -0.001 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.00 & 0 & 8.65 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix} \quad A_{W16}=0.01*\begin{bmatrix} -6.93 & 0 & 0 & 0 & 0 & -0.001 & 0 \\ 0 & -6.93 & 0 & -0.001 & 0 & 0 & 0 \\ 0 & 0 & -6.93 & 0 & -0.00 & 0 & 8.65 \\ 1.00 & 0 & 0 & -1.15 & 0 & 0 & 0 \\ 0 & 1.00 & 0 & 0 & -1.15 & 0 & 0 \\ 0 & 0 & 1.00 & 0 & 0 & -1.15 & 0 \\ 0 & 0 & 0 & 0.10 & 0 & 0 & -1.00 \end{bmatrix}$$