

$$\begin{aligned}
F &= p(s|\mu_x)p(\mu'_x|\mu_x,\nu) \\
s &= \mu_{x_3} + \omega_s \\
\dot{\mathbf{x}} &= \begin{bmatrix} \mu_{x_2} \\ -\phi\mu_{x_1} \\ \mu_\nu\mu_{x_1} - \mu_{x_3} \end{bmatrix} + \boldsymbol{\omega}_x \\
\nu &= \mu_\nu + \omega_\nu
\end{aligned}$$