

$$\begin{aligned}
& k_{10} \zeta_2(t) + k_{10} (\zeta_2(t) - \zeta_{P2}(t)) + 2 m_0 \left(\cos(\theta(t)) R(t) - \cos(\alpha(t)) \cos(\theta(t) + \psi(t)) \left(\frac{L_0}{2} + \eta_2(t) \right) \right) \\
& \zeta_2'(t) \left(\cos(\theta(t)) R'(t) + \cos(\theta(t) + \psi(t)) \sin(\alpha(t)) \left(\frac{L_0}{2} + \eta_2(t) \right) \alpha'(t) - R(t) \sin(\theta(t)) \theta'(t) + \right. \\
& \left. \cos(\alpha(t)) \sin(\theta(t) + \psi(t)) \left(\frac{L_0}{2} + \eta_2(t) \right) (\theta'(t) + \psi'(t)) - \cos(\alpha(t)) \cos(\theta(t) + \psi(t)) \eta_2'(t) \right) + \\
& \left(m_0 \left(\cos(\theta(t)) R(t) - \cos(\alpha(t)) \cos(\theta(t) + \psi(t)) \left(\frac{L_0}{2} + \eta_2(t) \right) \right)^2 + i_{xm2} \right) \zeta_2''(t) = \\
& c_{10} (\zeta_{P2}'(t) - \zeta_2'(t)) - c_{10} \zeta_2'(t)
\end{aligned}$$