

$$\begin{aligned}
& -k_{10}(\chi_6(t) - \chi_7(t)) + k_{10}(\chi_7(t) - \chi_8(t)) + \\
& 2m_0 \left( \cos(\theta(t)) R(t) - \cos(\alpha(t)) \cos(\theta(t) + \psi(t)) \left( \frac{3L_0}{10} + \eta_6(t) + \eta_7(t) \right) \right) \\
& \left( \cos(\theta(t)) R'(t) + \cos(\theta(t) + \psi(t)) \sin(\alpha(t)) \left( \frac{3L_0}{10} + \eta_6(t) + \eta_7(t) \right) \alpha'(t) - \right. \\
& \quad \left. R(t) \sin(\theta(t)) \theta'(t) + \cos(\alpha(t)) \sin(\theta(t) + \psi(t)) \left( \frac{3L_0}{10} + \eta_6(t) + \eta_7(t) \right) (\theta'(t) + \psi'(t)) - \right. \\
& \quad \left. \cos(\alpha(t)) \cos(\theta(t) + \psi(t)) (\eta_6'(t) + \eta_7'(t)) \right) \chi_7'(t) + \\
& \left( m_0 \left( \cos(\theta(t)) R(t) - \cos(\alpha(t)) \cos(\theta(t) + \psi(t)) \left( \frac{3L_0}{10} + \eta_6(t) + \eta_7(t) \right) \right)^2 + i_{zm7} \right) \chi_7''(t) = \\
& c_{10}(\chi_6'(t) - \chi_7'(t)) - c_{10}(\chi_7'(t) - \chi_8'(t))
\end{aligned}$$