

$$\begin{aligned}
& (\mathbf{a}_k (\alpha_i + \alpha_j) + \mathbf{y}_k (\eta_i + e^{-\alpha_i} \eta_j) + \\
& \quad \mathbf{b}_k (\beta_i + \beta_j + \eta_j \xi_i) + \mathbf{x}_k (e^{-\alpha_j} \xi_i + \xi_j)) + \\
& \left(\mathbf{a}_k \eta_j \xi_i - \frac{1}{2} \mathbf{b}_k \eta_j^2 \xi_i^2 - e^{-\alpha_i} \mathbf{y}_k \eta_j (\beta_i + \eta_j \xi_i) - \right. \\
& \quad \left. e^{-\alpha_j} \mathbf{x}_k \xi_i (\beta_j + \eta_j \xi_i) \right) \epsilon + \\
& \left(-\frac{1}{2} \mathbf{a}_k \eta_j^2 \xi_i^2 + \frac{1}{3} \mathbf{b}_k \eta_j^3 \xi_i^3 + \frac{1}{2} e^{-\alpha_i} \mathbf{y}_k \eta_j (\beta_i^2 + 2\beta_i \eta_j \xi_i + 2\eta_j^2 \xi_i^2) + \right. \\
& \quad \left. \frac{1}{2} e^{-\alpha_j} \mathbf{x}_k \xi_i (\beta_j^2 + 2\beta_j \eta_j \xi_i + 2\eta_j^2 \xi_i^2) \right) \epsilon^2 + \mathbf{0} [\epsilon]^3
\end{aligned}$$