Here we show the second and third moments of the statistical distribution of y_1 for the case $\gamma = 30$ as an example. For saddle 1,

$$\begin{aligned}\left\langle \left(y_1^{(2)} - \langle y_1^{(2)} \rangle\right)^2 \right\rangle =& \left(0.125361 k_{\mathrm{B}}T + 0.009344 (k_{\mathrm{B}}T)^2\right) \\ &+ 0.002713 k_{\mathrm{B}}T\dot{q}_2 + 0.004599 k_{\mathrm{B}}T\dot{q}_1 + 0.146876 k_{\mathrm{B}}T q_2 \\ &- 0.073522 k_{\mathrm{B}}T q_1 + 0.000430 k_{\mathrm{B}}T\dot{q}_2^2 + 0.000553 k_{\mathrm{B}}T\dot{q}_1\dot{q}_2 \\ &+ 0.000585 k_{\mathrm{B}}T\dot{q}_1^2 + 0.036293 k_{\mathrm{B}}T q_2\dot{q}_2 + 0.046173 k_{\mathrm{B}}T q_2\dot{q}_1 \\ &+ 1.113024 k_{\mathrm{B}}T {q_2}^2 - 0.008847 k_{\mathrm{B}}T q_1\dot{q}_2 - 0.018711 k_{\mathrm{B}}T q_1\dot{q}_1 \\ &- 0.738208 k_{\mathrm{B}}T q_1 q_2 + 0.149578 k_{\mathrm{B}}T {q_1}^2 \end{aligned} \quad (1)$$

$$\begin{aligned}\left\langle \left(y_1^{(2)} - \langle y_1^{(2)} \rangle\right)^3 \right\rangle =& 0.008656 (k_{\mathrm{B}}T)^2 + 0.001577 (k_{\mathrm{B}}T)^2\dot{q}_2 \\ &+ 0.001849 (k_{\mathrm{B}}T)^2\dot{q}_1 + 0.087158 (k_{\mathrm{B}}T)^2 q_2 \\ &- 0.029558 (k_{\mathrm{B}}T)^2 q_1 \end{aligned} \quad (2)$$

For saddle 2,

$$\begin{aligned}\left\langle \left(y_1^{(2)} - \langle y_1^{(2)} \rangle\right)^2 \right\rangle =& \left(0.125277 k_{\mathrm{B}}T + 0.006724 (k_{\mathrm{B}}T)^2\right) \\ &- 0.009788 k_{\mathrm{B}}T\dot{q}_2 - 0.004328 k_{\mathrm{B}}T\dot{q}_1 - 0.533951 k_{\mathrm{B}}T q_2 \\ &+ 0.070279 k_{\mathrm{B}}T q_1 + 0.000823 k_{\mathrm{B}}T\dot{q}_2^2 + 0.000424 k_{\mathrm{B}}T\dot{q}_1\dot{q}_2 \\ &+ 0.000313 k_{\mathrm{B}}T\dot{q}_1^2 + 0.064267 k_{\mathrm{B}}T q_2\dot{q}_2 + 0.023933 k_{\mathrm{B}}T q_2\dot{q}_1 \\ &+ 1.447027 k_{\mathrm{B}}T {q_2}^2 - 0.006892 k_{\mathrm{B}}T q_1\dot{q}_2 - 0.010155 k_{\mathrm{B}}T q_1\dot{q}_1 \\ &- 0.388647 k_{\mathrm{B}}T q_1 q_2 + 0.082451 k_{\mathrm{B}}T {q_1}^2 \end{aligned} \quad (3)$$

$$\begin{aligned}\left\langle \left(y_1^{(2)} - \langle y_1^{(2)} \rangle\right)^3 \right\rangle =& - 0.008050 (k_{\mathrm{B}}T)^2 + 0.001795 (k_{\mathrm{B}}T)^2\dot{q}_2 \\ &+ 0.001076 (k_{\mathrm{B}}T)^2\dot{q}_1 + 0.078675 (k_{\mathrm{B}}T)^2 q_2 \\ &- 0.017472 (k_{\mathrm{B}}T)^2 q_1 \end{aligned} \quad (4)$$