

$$\begin{aligned}
S_P = & \frac{1}{2}c_1 \sum_x P_x P_x^* - 2c_2 \sum_x \sum_y P_x Q^{r_{max}}(x-y) P_y^* \\
& - q_1 \sum_x (P_x P_x^*)^2 + q_2 \sum_x \sum_y P_x^2 Q^{r'_{max}}(x-y) (P_y^*)^2
\end{aligned}$$