$$
\begin{aligned}
f(\theta) \quad = \quad & \Big[(L_2(\cos\theta\sin\gamma+\sin\theta\cos\gamma)-y_2)\left({p_2}^2-{p_1}^2-(L_3\cos\theta-x_1)^2-{L_3}^2\sin^2\theta\right)-(L_3\sin\theta)\left({p_3}^2-{p_1}^2-(L_2(\cos\theta\cos\gamma-\sin\theta\sin\gamma)-x_2)^2-(L_2(\cos\theta\sin\gamma+\sin\theta\cos\gamma)-y_2)^2\right)\Big]^2 \\
& +\Big[-(L_2(\cos\theta\cos\gamma-\sin\theta\sin\gamma)-x_2)({p_2}^2-{p_1}^2-(L_3\cos\theta-x_1)^2-{L_3}^2\sin^2\theta)+(L_3\cos\theta-x_1)({p_3}^2-{p_1}^2-((L_2(\cos\theta\cos\gamma-\sin\theta\sin\gamma)-x_2)^2)-((L_2(\cos\theta\sin\gamma+\sin\theta\cos\gamma)-y_2)^2))\Big]^2 \\
& -4{p_1}^2\left[(L_3\cos\theta-x_1)\left(L_2\left(\cos\theta\sin\gamma+\sin\theta\cos\gamma\right)-y_2\right)-(L_3\sin\theta)\left(L_2\left(\cos\theta\cos\gamma-\sin\theta\sin\gamma\right)-x_2\right)\right]^2
\end{aligned}
$$