where θ is the angle between the two photons. This yields

$$E_\pi^2 - c^4 M_\pi^2 = \frac{E_\pi^2}{2}\left(1 + \cos\theta\right).$$

Therefore we find

$$\begin{aligned}\cos\theta &= \frac{2(E_\pi^2 - c^4 M_\pi^2)}{E_\pi^2} - 1 \\ &= 1 - \frac{2c^4 M_\pi^2}{E_\pi^2} \\ &= 1 - \frac{8 M_\pi^2 M_\Lambda^2}{(M_\Lambda^2 - M_n^2 + M_\pi^2)^2}.\end{aligned}$$