The η' production estimate

The estimate is based on $0.2\mu b$ cross section for η' production on proton target. Total luminosity for the 2000 run is $L = 2.69\ 10^7 \mu b^{-1}$, corresponding to $5\ 10^7 s^{-1}$ event rate and the total live time $t = 432h$. For B_e target

$$L_p = 4L = 1.077 * 10^8 \mu b^{-1} \tag{1}$$

$$L_n = 5L = 1.347 * 10^8 \mu b^{-1} \tag{2}$$

Total number of produced particles $N = \sigma L$ in a given channel is governed by the decay rate R. The total number of reconstructed particles depends also on the acceptance

$$N = \sigma LRA \tag{3}$$

Rate of interest:

$$\eta' \to \gamma\gamma = 2.12\% \tag{4}$$

$$\eta' \to \omega\gamma = 3.03\% \tag{5}$$

$$\omega \to \pi^0\gamma = 9.09\% \tag{6}$$

$$\eta' \to \eta\pi^0\pi^0 = 20.9\% \tag{7}$$

$$\eta \to \gamma\gamma = 39.43\% \tag{8}$$