The probability that $\{\mathrm{PMT}_a, ...\mathrm{PMT}_z\}$ will create $\{n_{ai}, ...n_{zi}\}$ PEs at time t_i is

$$P(n_{ai}, ..n_{zi}) = \sum_n \mathrm{Poisson}(n|N) \prod_c \mathrm{Binom}(n_{ci}|n, Q_c Y_i dt_i) \tag{1}$$

The probability that $\{n_{ai}, ...n_{zi}\}$ PEs will be resolved in $\{\mathrm{PMT}_a, ...\mathrm{PMT}_z\}$ due to PMT jitter and misalignment is

$$P(n_{ai}, ..n_{zi}) = \sum_n \mathrm{Poisson}(n|N) \prod_c \mathrm{Binom}\left(n_{ci}|n, Q_c dt_i n \sum_j dt_j Y_j \frac{e^{-(i-j-T_c)^2/(2\sigma_c^2)}}{\sqrt{2\pi}\sigma_c}\right) \tag{2}$$

P alignment

$$\begin{aligned} P_0(n_{a0}, ..n_{z0}) &= \sum_j \prod_{k<j} P(0_{ak}..0_{zk}) P(n_{aj}, ..n_{zj}) \\ P_0(n_{ai}, ..n_{zi}) &= \sum_j \prod_{k<j} P(0_{ak}..0_{zk}) \left(1 - P(0_{ak}..0_{zk})\right) P(n_{aj+i}, ..n_{zj+i}) \end{aligned} \tag{3}$$