

$$\begin{aligned}
\mathcal{L} = & \underbrace{\prod_{i,b} f\left(N_{ib} \mid \mu \cdot S_{ib} \cdot \prod_{r \text{ Syst.}} \nu_{br}(\theta_r) + \sum_k \beta_k \cdot B_{kib} \cdot \prod_{s \text{ Syst.}} \nu_{bs}(\theta_s)\right)}_{\text{Poisson for SR with signal strength } \mu; \text{ predictions } S, B} \cdot \underbrace{\prod_l f\left(N_l \mid \sum_k \beta_k \cdot B_{kl}\right)}_{\text{Poisson for profiled CRs}} \cdot \underbrace{\prod_{t \text{ Syst. in } \{r, s\}} g(\vartheta_t \mid \theta_t)}_{\text{Gauss. for syst.}} \cdot \underbrace{\prod_k f(\xi_k \mid \zeta_k \cdot \theta_k)}_{\text{Poiss. for MC stats}}
\end{aligned}$$