

$$\begin{aligned}
\left(F_N \middle| \sigma_{\text{NLO}}(t_{\text{f}})\right) &= \int_{t_2}^{t_{\text{f}}} dt_N \left(F_N \middle| N(t_{\text{f}}, t_N) W_{\Delta}(t_{\text{f}}, t_N, t_2) \middle| \sigma_N\right) \\
&+ \int_{t_2}^{t_{\text{f}}} dt_{N+1} \left(F_N \middle| U(t_{\text{f}}, t_{N+1}) W_{\Delta}(t_{\text{f}}, t_{N+1}, t_2) \middle| \sigma_{N+1}\right) \\
&+ \int_{t_2}^{t_{\text{f}}} dt_N \left(F_N \middle| U(t_{\text{f}}, t_N) W_{\Delta}(t_{\text{f}}, t_N, t_2) \middle| \sigma_N^{(1)}\right)
\end{aligned}$$