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$O_1 - O_7$ resolved-photon contribution to $B \rightarrow X_s \gamma$ at $\mathcal{O}(\alpha_s)$

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The inclusive radiative decay mode $B \rightarrow X_s \gamma$ provides an important channel for new physics searches. When the photon energy is large, $m_b - 2E_\gamma \sim \mathcal{O}(\Lambda_{\text{QCD}})$, methods from soft-collinear EFT can be used to construct a systematic heavy-quark expansion.

In this talk, I will discuss how to include $\mathcal{O}(\alpha_s)$ corrections to the power-suppressed resolved-photon contribution from the $O_1 - O_7$ interference.

The perturbative scale uncertainty from this term makes up a large portion of the error budget of this process, which is expected to significantly reduce after taking into account radiative corrections.

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