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Reducing Uncertainties in B to X_s gamma Decay

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The rare inclusive decay $\bar{B} \rightarrow X_s \gamma$ is an important probe of physics beyond the standard model. The largest uncertainty on the decay rate and CP asymmetry comes from resolved photon contributions. They first appear at order $1/m_b$ in the heavy quark expansion and arise from operators other than $Q_{\tau\gamma}$. One of the three leading contributions in the heavy quark expansion, $Q_1^q - Q_{\tau\gamma}$ is described by a non-local function whose moments are related to HQET parameters. We use recent progress in our knowledge of these parameters to better constrain the resolved photon contribution to $\bar{B} \rightarrow X_s \gamma$ total rate and CP asymmetry.

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