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Flavor Changing Neutral Currents Transition of the Sigma_Q to Nucleon in Full QCD and Heavy Quark Effective Theory

The loop level flavor changing neutral currents transitions of the $\Sigma_b \rightarrow n l^+ l^-$ and $\Sigma_c \rightarrow p l^+ l^-$ are investigated in full QCD and heavy quark effective theory in the light cone QCD sum rules approach. Using the most general form of the interpolating current for Σ_Q , $Q=b$ or c , as members of the recently discovered sextet heavy baryons with spin 1/2 and containing one heavy quark, the transition form factors are calculated using two sets of input parameters entering the nucleon distribution amplitudes, namely, QCD sum rules and lattice QCD inputs. The obtained results are used to estimate the decay rates of the corresponding transitions. Since such type transitions occurred at loop level in the standard model, they can be considered as good candidates to search for the new physics effects beyond the SM.

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