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Form Factors and Strong Couplings of Heavy Baryons from QCD Light-Cone Sum Rules

We derive QCD light-cone sum rules for the hadronic matrix elements of the heavy baryon transitions to nucleon. In the correlation functions the Λ_c, Σ_c and Λ_b -baryons are interpolated by three-quark currents and the nucleon distribution amplitudes are used. To eliminate the contributions of negative parity heavy baryons, we combine the sum rules obtained from different kinematical structures. The results are then less sensitive to the choice of the interpolating current. We predict the $\Lambda_b \to p$ form factor and calculate the widths of the $\Lambda_b \to p\ell\nu_l$ and $\Lambda_b \to p\pi$ decays.
Furthermore, we consider double dispersion relations for the same correlation functions and derive the light-cone sum rules for the $\Lambda_c ND^{(*)}$ and $\Sigma_c ND^{(*)}$ strong couplings. Their predicted values can be used in the models of charm production in $p\bar{p}$ collisions.

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