Heavy baryons in the nonperturbative string approach

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We employ the general formalism for the baryons, which is based on the simple approximation within the nonperturbative QCD and where the only inputs are the string tension σ and the strong coupling constant α_s defined at the scale $\mu \sim 1$ GeV. We present some piloting calculations of masses and short–range correlation coefficients for light and heavy baryons. The basic feature of our approach is the dynamical calculation of the quark constituent masses m_i in terms of the quark current masses $m_i^{(0)}(\mu)$, defined at the appropriate scale μ. This has been done within the einbein (auxiliary fields) approach, which is proven to be rather accurate in various calculations for relativistic systems. The einbeins are treated as the variational parameters which are to be found from the condition of the minimum of baryon eigen energy. The quark masses are computed solely in terms of σ and α_s and depend on a baryon. We have also performed the calculations of the spin–averaged masses of baryons with two heavy quarks. Our predictions are especially close to those obtained in the constituent quark model using a variant of the power–law potential adjusted to fit ground state baryons.