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Cosmological models with QGP: DM, DE and scalar perturbations

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The background evolution problem is resolved for the Universe endowed with relic colored objects –quarks and gluons –that survived hadronization either as isolated islands of quark-gluon “nuggets”(QNs), or as a uniform fluid. In the first scenario, QNs can play the role of dark matter. In the second scenario, uniform colored objects can play the role of dark energy providing the late-time acceleration. In addition, we investigate scalar perturbations of the FLRW metric due to inhomogeneities of dustlike matter as well as fluctuations of QNs. The nonrelativistic gravitational potential is determined by the distribution of inhomogeneities of both dustlike matter and QNs. Consequently, QNs can have an influence on the galaxy rotation curves, replacing (at least partially) the dark matter for the solution of the corresponding problem of their flatness.

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