a maximum of energy. As one can easily see, the system will either expand or collapse depending on its actual baryon number compared to $N_{\min}$. Moreover, the electrostatic force can support only the surface layer of matter where the electric field is nonzero. The inner layers of the star require the kinetic pressure to resist gravity. Therefore, the mechanism discussed in ref. [7] cannot produce any new stable object. Inclusion of the electrostatic effects will only slightly increase the star mass, see e. g. ref. [8].

In conclusion, we have demonstrated that very strong electric fields can be generated on a sharp boundary separating the bulk matter from the vacuum. The strength of the field is determined by the separation of positive and negative charges in the surface layer. For the proton charge distribution with the diffuseness parameter of a nuclear scale the field strength may exceed significantly the critical value for the electron-positron pair production. The field strength diminishes when the charge distribution becomes more and more smooth. We have also considered star-like configurations with a strong electric field on the boundary. Our simple analysis shows that such electric field alone cannot balance the gravitational force to produce stable objects. The stable compact star configurations appear only when the counter-pressure of degenerate fermions is taken into consideration. For a more accurate description of compact stars with strong electric fields one should perform calculations within General Relativity and include effects of strong interactions in the energy of the nuclear core.

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