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High density and/or high temperature nuclear matter may be a source of high energy cosmic particles.

The present paper focuses on one of the possible sources of high energy cosmic particles.
In system where the temperature and density is near the QCD critical ones there is some probability that the energies of group of partons will transfer to one or to several partons as a result of nucleon collective effects (as a result of nucleons percolation for example [H.Satz. arXiv:hep-ph/0212046 v1; Janusz Brzychczy.arXiv:nucl-th/0407008 v1; C. Pajares.arXiv:hep-ph/0501125 v1]). It follows from that about 25 years ago by the European Muon Collaboration (EMC) at CERN in deep-inelastic muon-nucleus scattering [J.J. Aubert et al., Phys. Lett. 123B, 275 (1983)] it was observed that the structure function F2 and hence the quark and gluon distributions of a nucleon bound in a nucleus differ from those of a free nucleon. Some early experiments in JINR Dubna showed that at energy around several GeV the particle production in nuclear collisions is set up in the asymptotic regime [A.M. Baldin et al. Sov.J. Nucl.Phys.18,41 (1973)]. This means that the achievement of invariability of the physical picture of the secondary particle production in nuclear fragmentation with increasing collision energy or the achievement of the so-called limiting fragmentation of nuclei. A remarkable peculiarity of the phenomena is the spreading of these properties also to particles produced behind the kinematic limit of free nucleon collisions. In the language of the parton model, this fact points out that nuclei contain multiquark states.
The parton (or partons) which have had high energy could leave the hot and/or density system with minimum energy loses and transform to hadrons. The values of Feynman x of these particles as well as its energies could be limited by values of the total energy of the collected nucleons system only.
It is expected that some medium with high density close to the QCD critical one can be formed in the center of some massive starts (for example of neutron stars [A. G. Lyne and F. G. Smith. Pulsar Astronomy. Cambridge University Press, 1990.]) due to high density of matter the deconfinement (and parton structure) could appear in these mediums. The same structure could also be formed during the mixed phase formation in heavy ion collisions at relativistic and ultrarelativistic energies [A.N. Sissakian, A.S. Sorin, M.K. Suleymanov, V.D. Toneev , G.M. Zinovjev. Properties of strongly interacting matter and search for a mixed phase at the JINR Nuclotron. Phys. Part.Nucl.Lett.5:1-6,2008]. The parton (or partons) with long values of x (or E) could be formed in this system, to transform to hadrons and appear as high energy cosmic particles.

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