

COMMENT ON “INVESTIGATION
OF HADRON MULTIPLICITY AND HADRON
YIELD RATIOS IN HEAVY-ION COLLISIONS”

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S u m m a r y

Oliinychenko, Bugaev, and Sorin [arXiv:1204.0103 [hep-ph]] considered the role of conservation laws in discussing possible weaknesses of thermal models which are utilized in describing the hadron multiplicities measured in central nucleus-nucleus collisions. They argued to analyze the criteria for chemical freeze-out and to conclude that none of them was robust. Based on this, they suggested a new chemical freeze-out criterion. They assigned to the entropy per hadron the *ad hoc* value 7.18 and supposed to remain unchanged over the whole range of the baryo-chemical potentials. Due to the unawareness of the recent literature, the constant entropy per hadron has been discussed in Refs. [Fizika B **18**, 141 (2009), Europhys. Lett. **75**, 420 (2006), Phys. Rev. C **85**, 014908 (2012) and nucl-ph/1306.3291]. Furthermore, it has been shown that the constant entropy per hadron is equivalent to the constant entropy normalized to the cubic temperature, an earlier criterion for the chemical freeze-out introduced in Refs. [Europhys. Lett. **75**, 420 (2006), Nucl. Phys. A **764**, 387 (2006)]. In this comment, we list out the ignored literature, compare between the entropy-number density ratio and two criteria of averaged energy per averaged particle number and constant entropy per cubic temperature. All these criteria are confronted to the experimental results. The physics of constant entropy per number density is elaborated. It is concluded that this ratio cannot remain constant, especially at large chemical potentials related to the AGS and SIS energies.