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MODIFICATION OF HADRON PROPERTIES IN A DENSE AND HOT BARYONIC MATTER

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One of the main questions relating to heavy ion collisions "How much of incident energy is converted into a compression of nuclear matter?"has not found a definite answer yet. Equation of State (EoS) which describes density dependence of the energy density achieved in a hot and dense nuclear matter is not specified yet for heavy ion collisions. High compression should change both the initial state of colliding nuclei consisting of protons and neutrons and the properties of produced secondary particles. Starting with the Strongly Correlated Quark Model of a hadron structure, SCQM [1, 2], we demonstrate how the properties of mesons and baryons can be modified in hot and dense nuclear environment. It is shown that at these conditions nucleons are converted into delta-isobars, hyperons and their excitations, and mesons are produced predominantly via vector resonances. Moreover, the properties of vector mesons consisting of light quarks changes drastically. Their masses drop and widths are widening. These in-medium modifications can lead to the observable effects in heavy ion collisions, especially in NICA energy range, such as enhancement of strangeness, like "horn-effect", and enhancement of dilepton invariant mass spectra at 0.2 –0.7 MeV.

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