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The vorticity and acceleration phenomena in the heavy-ion collisions at the NICA complex energies

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In this topic, the discussion will focus on vorticity and acceleration of the nuclear medium created in heavy-ion collisions at the NICA complex energies. These phenomena will be analyzed within the framework of the Parton-Hadron-String Dynamics (PHSD) model. The vorticity field is the object of study due to its connection to the spin polarization and also due to its intricate space-time structures, such as vortex rings. Conversely, an acceleration in heavy-ion collisions signifies a novel direction in the current research by the scientific community, especially due to its influence on phase transitions. In this study, the acceleration (and the Unruh temperature) space-time distributions will be presented and subsequently compared with the temperatures of the medium for the various phases of matter [1]. Also we will discuss some results studied in our previous works [2-5].

[1] G. Yu. Prokhorov, D. A. Shohonov, O. V. Teryaev, N. S. Tsegelnik, V. I. Zakharov. arXiv:2502.10146.
[2] N. S. Tsegelnik, E. E. Kolomeitsev, and V. Voronyuk. Phys. Rev. C, 107(3):034906, 2023.
[3] Nikita Tsegelnik, Evgeni Kolomeitsev, and Vadym Voronyuk. Particles, 6(1):373–384, 2023.
[4] Nikita S. Tsegelnik, Vadym Voronyuk, and Evgeni E. Kolomeitsev. Particles, 7(4):984–1003, 2024.
[5] V. Voronyuk, N. S. Tsegelnik, and E. E. Kolomeitsev. Phys. Rev. C, 111(3):034907, 2025.

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