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Early thermalization and shear viscosity to entropy ratio in heavy-ion collisions at energies of BES, FAIR and NICA.

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Equilibration of highly excited baryon-rich matter is studied within the microscopic model calculations in A+A collisions at energies of BES, FAIR and NICA. It is shown that the system evolution from the very beginning of the collision can be approximated by relativistic hydrodynamics, although the hot and dense nuclear matter is not in local equilibrium yet.
During the evolution of the fireball the extracted values of energy density, net baryon and net strangeness densities are used as input to Statistical Model (SM) in order to calculate temperature, chemical potentials and entropy density of the system. Also, they are used as an input for the box with periodic boundary conditions to investigate influence of initial cut-off time on momentum correlators in the infinite nuclear matter. Shear viscosity is calculated according to the Green-Kubo formalism.
At all energies, shear viscosity to entropy density ratio shows minimum at time corresponding to maximum baryon density. The ratio dependence on the SM temperature, baryon chemical potential and strangeness chemical potential is investigated.

Primary author: ZABRODIN, Evgeny (Universiyu of Oslo)

Co-authors: BRAVINA, Larisa (University of Oslo (NO)); Mr TESLYK, Maksym (TSNU Kiev and UiO Oslo)

Presenter: ZABRODIN, Evgeny (Universiyu of Oslo)

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