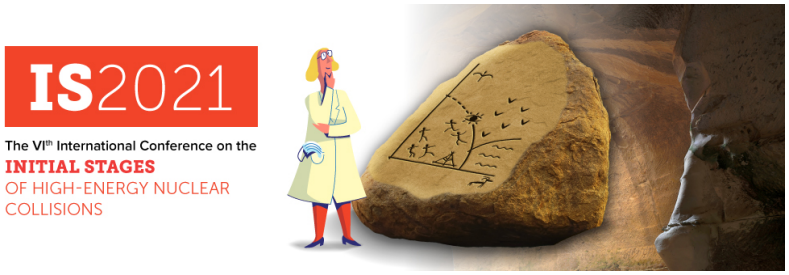

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Exploring the QCD phase diagram within a microscopic transport approach

Monday 11 January 2021 19:40 (1h 30m)

We study the thermal equilibration and properties of the matter produced at the Beam Energy Scan (BES) program by employing the Parton-Hadron-String Dynamics (PHSD) transport approach which consistently describes the whole non-equilibrium dynamics of heavy-ion collisions, from the early nucleon hard scatterings, to the partonic phase based on the effective propagators and couplings from the Dynamical QuasiParticle Model (DQPM), and up to the final hadron rescatterings. We calculate the energy-momentum tensor and charge currents as a function of the proper time τ and the space-time rapidity η in order to extract local thermodynamic variables such as energy density and charge densities. We combine the equation of state from the hadron resonance gas model and lattice QCD results in order to illustrate the regions probed in the QCD phase diagram for each collisional energy. We find that, on average, our results follow closely the isentropic trajectories at fixed $\langle s \rangle / \langle n_B \rangle$, however the spread of the trajectory in the $(T - \mu_B)$-plane is significant. Finally, we study the dissipative currents and the associated inverse Reynolds numbers in order to assess the degree of equilibration throughout the heavy-ion collision.

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