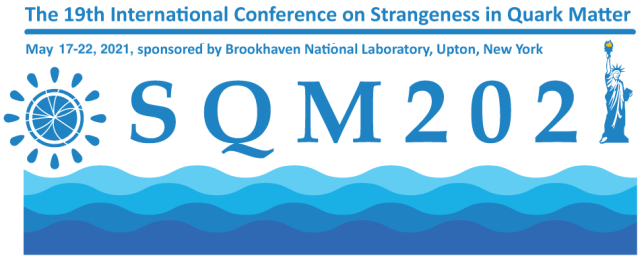

Contribution ID: **163** Type: **Theory talk**

Is the chemical freeze-out connected to the phase transition? A transport study of freeze-out criteria

Wednesday, 19 May 2021 09:30 (20 minutes)

The chemical freeze-out is often related to the phase transition to a deconfined state of matter, the Quark Gluon Plasma. We introduce a novel approach based on elastic and inelastic scattering rates to extract the hyper-surface of the chemical freeze-out from a hadronic transport simulation. We use the Ultra-relativistic Quantum Molecular Dynamics (UrQMD) model to extract the chemical freeze-out hyper-surface of pions and kaons in the energy range from E_{lab} = 1.23 AGeV to $\sqrt{s_{NN}}$ = 62.4 GeV. By employing a coarse-graining procedure, we can extract the local temperature and baryo-chemical potential and investigate the typical freeze-out criteria $\langle E \rangle / \langle N \rangle$ = 1 GeV, s/T^3 = 7 and $n_B + n_{\bar{B}}$ = 0.12 fm^{-3} on the chemical freeze-out surface and compare them to results from statistical model analysis. We find a great agreement leading to the conclusion that the chemical freeze-out can be well described by hadronic transport simulations. We do not observe a relation of the chemical freeze-out line and the phase-transition line. Instead we argue that the freeze-out line is defined by an interplay between elastic, inelastic and pseudo-elastic scattering rates and the expansion rate.

Collaboration

Primary authors: REICHERT, Tom (Institut für Theoretische Physik, Goethe Universität Frankfurt); BLEICHER, Marcus (Uni Frankfurt); Dr INGHIRAMI, Gabriele (GSI)

Presenter: REICHERT, Tom (Institut für Theoretische Physik, Goethe Universität Frankfurt)

Session Classification: Bulk (Transport)