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The many onsets of NA61/SHINE

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NA61/SHINE is a fixed target experiment operating at the CERN Super-Proton-Synchrotron (SPS). The main goal of the experiment is the study of the phase diagram of strongly interacting matter. This goal is pursued by performing a two-dimensional scan by varying the beam momentum (13A-158A GeV/c) and the system size (p+p, Be+Be, Ar+Sc, Xe+La, Pb+Pb) of the collisions.

The properties of strangeness production show nontrivial dependence on the beam momentum. This dependence is interpreted as the onset of deconfinement. The prediction of theoretical models will be compared with the measured data.

A new effect, onset of fireball, is indicated by the unexpected similarity between p+p and Be+Be data. Collisions of the light systems can be treated as a superposition of nucleon-nucleon collisions. However, a rapid qualitative change of the value of various observables occurs when colliding heavier systems. This may indicate another threshold behaviour of strongly interacting matter.

The theoretical models SMES and PHSD describe the onset of deconfinement in the heaviest system relatively well. However, no model describes the behaviour of the data in previously unmeasured collisions of light and intermediate size ions. The onset of fireball is not described by models at all.

Content type

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