

During relativistic heavy-ion collisions matter in extreme conditions can be formed in a laboratory. In the interaction region a droplet of matter of high density and temperature is created, the quark-gluon plasma. The most unexpected result in this field in the last few years was the observation of collective flow in small collision systems, e.g. proton-nucleus collisions. Experiments observe similar characteristics as in collisions of larger systems, indicating that a droplet of dense matter is formed and expands. In the course of the expansion a strong collective flow of the fluid forms. These observations suggest that a „smallest droplet of fluid” is created in small collisions systems.

Qualitatively similar results can be reproduced in cascade models, where particles scatter at most a few times. Such a model explains the data without assuming that a dense fluid is formed. The aim of the project is to find experimental observables, that could differentiate the two scenarios. In that way we could determine convincingly whether a smallest droplet of dense fluid is formed in proton-nucleus collisions.