Contribution ID: **119** Type: **Talk**

Directed flow in heavy-ion collisions and softening of equation of state

Tuesday, 31 May 2016 12:00 (30 minutes)

We analyze the directed flow (v_1) of protons and pions
in high-energy heavy-ion collisions in the incident energy range
from $\sqrt{s_{NN}} = 7.7$ GeV to 27 GeV
within a microscopic transport model [1].
Standard hadronic transport approaches do not explain the collapse of directed flow below
$\sqrt{s_{NN}} \simeq 20$ GeV.
By contrast, when we take acount of a softening of the equation of state
via the attractive orbit scattering [2],
we can well describe the behavior of directed flow data recently obtained by the STAR collaboration [3].
We argue that the observed collapse of directed flow at midrapidity at 9 GeV $\leq \sqrt{s_{NN}} \leq 20$ GeV
is the evidence for the softening of the QCD equation of state.
We also discuss the possible density region where the softening takes place.

[1] Y. Nara, A. Ohnishi, H. St\"ocker, arXiv:1601.07692 [hep-ph].
[2] H. Sorge, Phys. Rev. Lett. 82 (1999), 2048;
P. Danielewicz and S. Pratt, Phys. Rev. C 53 (1996), 249.
[3] L. Adamczyk et al. [STAR Collaboration], Phys. Rev. Lett. 112 (2014), 162301.

Primary author: OHNISHI, Akira (Kyoto University)

Presenter: OHNISHI, Akira (Kyoto University)

Session Classification: Plenary session