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Unravelling the partonic flow in small systems with an improved multi-phase transport model

Thursday 18 July 2024 11:36 (17 minutes)

Precision measurements of transverse momentum-differential elliptic flow, $v_2(p_{\mathrm{T}})$, of identified particles have been done in proton-lead (p-Pb) collisions. The characteristic mass-ordering of $v_2(p_{\mathrm{T}})$ at low p_{T} and the grouping/splitting of $v_2(p_{\mathrm{T}})$ for mesons and baryons at intermediate p_{T}, which have been regarded as the smoking gun of QGP signal, are observed in p-Pb collisions. However, the exact physics mechanism is not entirely clear. A multi-phase transport (AMPT) model incorporating a partonic phase followed by quark coalescence hadronization can reproduce the flow measurements. The mass-ordering can be reproduced in p-Pb collisions by the standard AMPT, while the grouping/splitting remains challenging. This talk significantly improves the coalescence in AMPT by implementing a precise quark phase-space distribution, which reproduces the measured grouping/splitting of $v_2(p_{\mathrm{T}})$ in p-Pb collisions for the first time.

Alternate track

I read the instructions above

Yes

Primary author: WU, Wenya (Fudan University (CN))

Co-authors: Prof. MA, Guoliang (Fudan University); Ms DUAN, Xiangpan (Fudan University); ZHOU, You (Niels Bohr Institute (DK))

Presenter: Ms DUAN, Xiangpan (Fudan University)

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