

11th International Conference on Hard and Electromagnetic Probes of High-Energy Nuclear Collisions



Beitrag ID: 106

Typ: Talk

Resolving the R_{pA} and v_2 puzzle of D^0 mesons in $p - Pb$ collisions

Mittwoch, 29. März 2023 10:50 (20 Minuten)

It has been a challenge to understand the experimental data on both the nuclear modification factor and elliptic flow of D^0 mesons in $p-Pb$ collisions at LHC energies. In this work^[1], we study these observables with an improved multi-phase transport model. After including the Cronin effect (or transverse momentum broadening) and independent fragmentation for charm quarks, we provide the first simultaneous description of the D^0 meson R_{pA} and v_2 data at $p_T \leq 8$ GeV/c. The model also provides a reasonable description of the D^0 meson p_T spectra and the low- p_T (below ~ 1.5 GeV/c) charged hadron spectra, R_{pA} and v_2 . We find that both parton scatterings and the Cronin effect are important for the D^0 meson R_{pA} , while parton scatterings are mostly responsible for the D^0 meson v_2 . Therefore, it is crucial to include the Cronin effect for the simultaneous description of the D^0 meson R_{pA} and v_2 . Since the Cronin effect is expected to grow with the system size, this work also implies that it could be important for heavy hadrons in large systems.

Experiment/Theory

Theory/Phenomenology

Affiliation

¹Department of Physics, East Carolina University, Greenville, North Carolina 27858, USA

²China University of Geosciences, Wuhan 430074, China

³Key Laboratory of Quark & Lepton Physics (MOE) and Institute of Particle Physics, Central China Normal University, Wuhan 430079, China

Hauptautor: Dr. LIN, Zi-Wei

Co-Autoren: Dr. ZHENG, Liang; Dr. SHI, Shusu; ZHANG, Chao

Vortragende(r): Dr. LIN, Zi-Wei

Sitzung Einordnung: Parallel: Heavy Flavours & Quarkonia

Track Klassifizierung: Heavy flavor and quarkonia