Contribution ID: **1086** Type: **Poster**

Quarkonium medium response with dynamical hydro simulation from small to large systems

Quarkonia are golden probes for studying the properties of the medium produced in heavy ion collisions. Various measurements for different quarkonium species at RHIC and the LHC indicate that their suppression levels follow the ordering of their binding energies. Additionally, recombination effects are substantial in nucleus-nucleus collisions, particularly charmonium states. However, questions still remain about disentangling the various in-medium effects and how they contribute to the final observables.
On the other hand, quarkonium production in small systems is another complex topic, with recent unexpected experimental results.
SHINCHON (Simulation for Heavy IoN Collision with Heavy-quark and ONia) is a simulation framework that tries to address these challenges with tracking the quarkonium survival probabilities during the space-time evolution of the medium. The interaction mechanisms are based on theoretical calculations of gluo-dissociation and inelastic parton scattering. These effects are embedded within a hydrodynamical event generator (superSONIC) that uses initial geometry information from Glauber MC. The hydrodynamical setup reproduces observed event multiplicity and flow harmonics in data. SHINCHON qualitatively describes the modification of bottomonium states in Pb–Pb and Au-Au collisions found in data, including nuclear absorption effects at RHIC energies [1,2].
For small systems, we present the modifications in p-Pb collisions in comparison with data and provide predictions for p-O and O-O collisions [1]. Lastly, we discuss the factors affecting the relative modifications of excited and ground states for both charmonia and bottomonia, motivated by recent experimental results.

[1] SHINCHON Collaboration, Phys.Rev.C 107 (2023) 5, 054905, arXiv:2209.12303 [nucl-th]
[2] SHINCHON Collaboration, arXiv:2405.11689 [nucl-th]

Category

Theory

Collaboration (if applicable)

Authors: PARK, Jaebeom; SEO, Jinjoo (Heidelberg University (DE)); KIM, Junlee (CERN); LIM, Sanghoon (Pusan National University (KR))

Presenter: PARK, Jaebeom

Session Classification: Poster session 2

Track Classification: Heavy flavor & quarkonia