



Contribution ID: 46

Type: **contributed parallel talk**

Charm meson and charm-meson molecule in an expanding hadron gas

Thursday, July 20, 2023 3:00 PM (20 minutes)

We study the time evolution of the number of charm mesons after the kinetic freeze-out of the hadron gas produced by a central heavy-ion collision. The $\pi D^* \rightarrow \pi D^*$ reaction rates have t-channel singularities that give contributions inversely proportional to the thermal width of the D . The ratio of the 0 and $^+$ production rate can differ significantly from those predicted using the measured D^* branching fractions.

We then study the thermal correction to the propagator of a loosely bound charm-meson molecule in a pion gas to next-to-leading order in the heavy-meson expansion. The correction comes primarily from the complex thermal energy shift of the charm-meson constituents. The remaining correction gives a tiny decrease in the binding energy of the molecule and a tiny change in its thermal width. These results are encouraging for the prospects of observing (3872) and $T_{cc}(3875)$ in the expanding hadron gas produced by heavy-ion collisions.

Consent

I do not consent to recording/broadcasting of my presentation.

Primary authors: BRAATEN, Eric (Ohio State University); BRUSCHINI, Roberto (Ohio State University); HE, Liping (Universität Bonn); INGLES, Kevin (Ohio State University); JIANG, Jun (Shandong University)

Presenter: HE, Liping (Universität Bonn)

Session Classification: Parallel B

Track Classification: spectroscopy