

# Measurement of the mass difference and the binding energy of the hypertriton and antihypertriton with the Heavy Flavor Tracker at RHIC-STAR

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The Hyperon-Nucleon (YN) interactions play an important role in understanding the strong interaction. It is suggested that alternative YN couplings can be a possible solution to the recent observations of neutron star exceeding two solar masses, the so-called “hyperon puzzle”. A precise measurement of binding energies of hypertriton and antihypertriton can enrich our knowledge on YN interactions. On the other hand, the precise measurement of mass difference between hypertriton and antihypertriton can provide validation of CPT symmetry in hypernuclei sector and constraint on the parameters of SME (Standard Model Extension).

In this talk, we will present the first precise measurement of mass difference between hypertriton and antihypertriton in heavy-ion collisions at STAR with the Heavy Flavor Tracker (HFT). Hypertritons and antihypertritons are reconstructed through both two-body ( ${}^3\text{He} + \pi^-$ ) and three-body ( $p + d + \pi^-$ ) decay channels using the high-statistics data collected in 2014 and 2016 Au+Au collisions at  $\sqrt{s_{NN}} = 200$  GeV. The measured masses will be used to extract the binding energies for hypertriton and antihypertriton. Physics implications on the understanding of YN interactions will be discussed.

## Abstract Type

Poster

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