

## UH Physics Research Day - 2024



Contribution ID: 17

Type: **Talk**

# Entanglement Entropy in p-p Collisions at LHC Energies

*Saturday 24 February 2024 13:48 (12 minutes)*

In an effort to better understand the thermal-like behavior and particle yields seen in p-p collisions we recast the problem employing the principles of quantum states and their entanglement in the produced system. We seek to show that this entanglement in the initial state has a measurable effect on the evolution of the system and is the driving mechanism behind the thermal-like behavior and particle yields observed. Recent studies have demonstrated that entanglement in the initial state could endure the evolution of a strongly coupled system. Consequently, we attempt to show equivalence in a calculation of the initial state entropy (calculated using PDF's) and the final state entropy (calculated using multiplicity distributions). Multiplicity distributions used in this study are that of primary charged particles, measured using the ALICE detector at the LHC.

### Academic year

5th year and/or beyond

### Research Advisor

Rene Bellwied

**Author:** HUTSON, A (University of Houston (US))

**Presenter:** HUTSON, A (University of Houston (US))

**Session Classification:** High Energy and Quantum Field Theory

**Track Classification:** High Energy Physics, Nuclear Theory and QFT