



Contribution ID: 64

Type: **Oral**

Entanglement of identical particles

Friday, 2 October 2020 15:30 (7 minutes)

Entanglement is a well defined and useful notion for distinguishable particles. It provides a framework of locality and can be used as a resource in quantum information and communication protocols. However, for identical particles, no universal accepted definition exists. The symmetrization principle makes identical particle states look entangled when written in first quantization notation. In particular, the state of two hydrogen atoms, one on the moon and one on the earth, which have never met each other cannot be written as a tensor product. However, because of the symmetrization, one also has to restrict the allowed operators on the Hilbert space. This means that one cannot easily infer nontrivial correlations in the systems by comparing the states of identical particles with their distinguishable counterparts. In my seminar, I want to address the question of entanglement for identical particles, with the particular example of the aforementioned hydrogen atoms. We will use recently developed guiding principles to motivate a useful notion of entanglement and show how to apply it on this given problem.

Presenter: JOHANN, Till (Ruprecht-Karls-Universität Heidelberg)

Session Classification: Contributed