



Contribution ID: 313

Type: **Workshop**

## Deuteron quasi-free scattering reactions: a tool to probe nucleon-nucleon short-range correlations in atomic nuclei

*Friday, 1 December 2023 17:05 (25 minutes)*

The experimental evidence points to the existence, at short distances, of strongly correlated neutron-proton pairs much like they are in the deuteron or in free scattering processes.

As it moves through the nuclear medium, a “bare” nucleon in the presence of the nucleon-nucleon interaction becomes “dressed” in a quasi-deuteron cloud, about 20% of the time. Our phenomenological analysis of the independent-particle model content in a dressed nucleon [1] has an isospin dependence which is also reflected on the dressed amplitude. Thus, the qualitative arguments above, suggest that quasi-free scattering (QFS) of deuterons could offer a sensitive probe to examine these concepts.

In this contribution, we will discuss these ideas and present an experiment that aims at measuring the (p,pd) QFS cross-section for knocking out a deuteron in  $^{10,14,16}\text{C}$  relative to  $^{12}\text{C}$  as a tool to probe short-range correlations and their isospin dependency.

[1] S. Paschalis, M. Petri, A.O. Macchiavelli, O. Hen, and E. Piasetzky, Physics Letters B 800 (2020) 135110

### Attendance Type

In-person

**Primary authors:** PETRI, Marina (University of York); Dr PASCHALIS, Stefanos (University of York); MACCHIAVELLI, Augusto (Oak Ridge National Laboratory)

**Presenter:** PETRI, Marina (University of York)

**Session Classification:** Workshop Session B

**Track Classification:** Workshop Talks